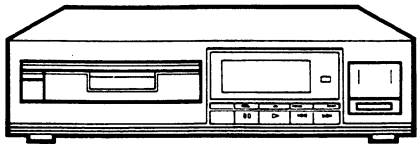
PIONEER®
The future of sound and vision.

Service Manual



ORDER NO.
ARP 1480

COMPACT DISC PLAYER

PD-Z71

MODEL PD-Z71 HAVE THREE VERSIONS;

Type	Power requirement	Export destination
HEM	AC 220 V 240 V (switchable)	European continent
HB	AC 220 V 240 V (switchable)	United Kingdom
SD	AC 110 V, 120 V-127 V, 220 V, 240 V (switchable)	Kingdom of Saudi Arabia and general market

- **This service manual is applicable to the HEM, HB and SD types.**
- **As to the Disassembly of Mechanism section, please refer to the PD-X66 service manual (ARP1433).**
- **As to the circuit and mechanism descriptions, please refer to the PD-7050, PD-7050-S, PD-6050, PD-6050-S, PD-5050, PD-5050-S, PD-4050 and PD-4050-S service manual (ARP1352).**

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PIONEER ELECTRONIC CORPORATION 4-1, Meguro 1-Chome, Meguro-ku, Tokyo 153, Japan
PIONEER ELECTRONICS SERVICE INC. P.O. Box 1760, Long Beach, California 90801 U.S.A.
PIONEER ELECTRONICS OF CANADA, INC. 505 Cochrane Drive, Markham, Ontario L3R 8E3 Canada
PIONEER ELECTRONIC [EUROPE] N.V. Keetberglaan 1, 2740 Beveren, Belgium
PIONEER ELECTRONICS AUSTRALIA PTY. LTD. 178-184 Boundary Road, Braeside, Victoria 3195, Australia TEL: [03] 580-9911

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1. SAFETY INFORMATION

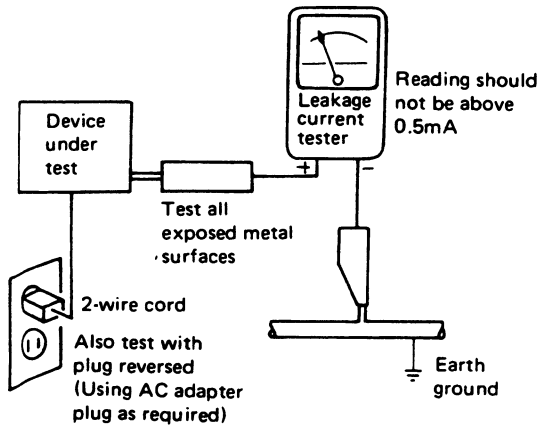
(FOR USA MODEL ONLY)

1. SAFETY PRECAUTIONS

The following check should be performed for the continued protection of the customer and service technician.

LEAKAGE CURRENT CHECK

Measure leakage current to a known earth ground (water pipe, conduit, etc.) by connecting a leakage current tester such as Simpson Model 229-2 or equivalent between the earth ground and all exposed metal parts of the appliance (input/output terminals, screwheads, metal overlays, control shaft, etc.). Plug the AC line cord of the appliance directly into a 120V AC 60Hz outlet and turn the AC power switch on. Any current measured must not exceed 0.5mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

2. PRODUCT SAFETY NOTICE

Many electrical and mechanical parts in the appliance have special safety related characteristics. These are often not evident from visual inspection nor the protection afforded by them necessarily can be obtained by using replacement components rated for voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual.

Electrical components having such features are identified by marking with a ⚠ on the schematics and on the parts list in this Service Manual.

The use of a substitute replacement component which does not have the same safety characteristics as the PIONEER recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards.

Product Safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current PIONEER Service Manual. A subscription to, or additional copies of, PIONEER Service Manual may be obtained at a nominal charge from PIONEER.

(FOR EUROPEAN MODEL ONLY)

VAROITUS!
LAITE SISÄLTÄÄ LASERDIODIN, JOKA LÄHETTÄÄ NÄKYMÄTÖNTÄ, SILMILLE VAARALLISTA INFRAPUNASÄTEILYÄ LAITTEEN SISÄLLÄ ON LASERDIODIN LÄHEISYYDESSÄ KUVAN 1. MUKAINEN VAROITUSMERKKI.

LASER
Kuva 1
Lasersateilyn varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

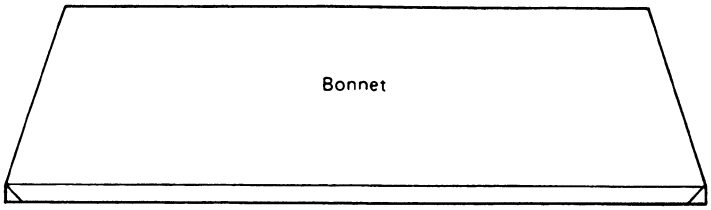
LASER
Picture 1
Warning sign for laser radiation

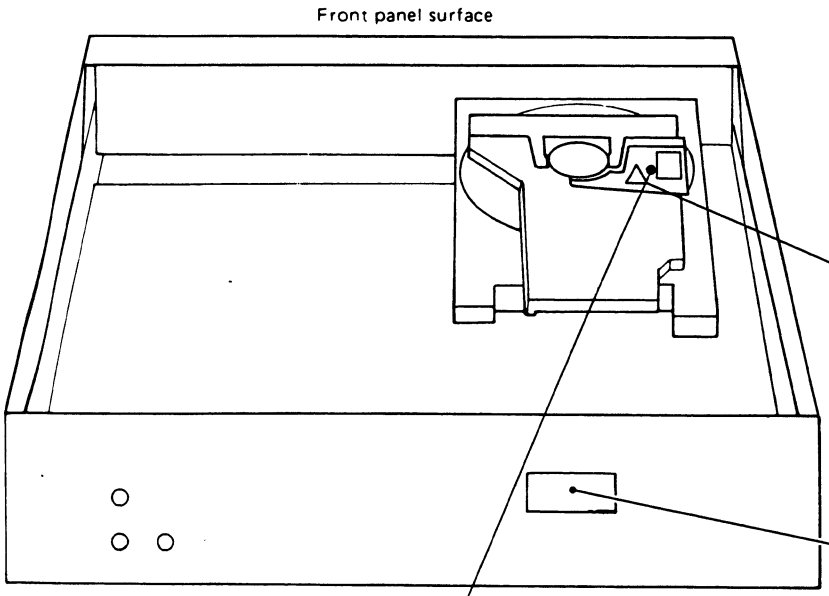
ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

IMPORTANT
PIONEER COMPACT DISC PLAYER APPARATUS CONTAINS LASER OF HIGHER CLASS THAN 1. SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

VIKTIGT
APARATEN INNEHÅLLER LASER AV HÖGRE KLASS ÄN 1. INGREPP I APPARATEN BÖR GÖRAS AV SPECIELLT UTBILDAD PERSONAL.

LABEL CHECK

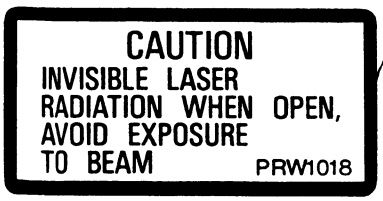




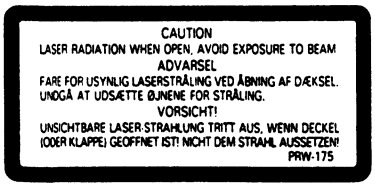
HEM and HB models

HEM and HB models

HB model



HEM model



ADDITIONAL LASER PRECAUTIONS

1. Laser Interlock Mechanism
   The clamp switch (S102) detects the completion of the Load in operation, and the ON/OFF status of the clamp switch is in turn detected by the microcomputer. The laser diode is designed not to oscillate while the clamp switch is in OFF status.
   Consequently, if S102 is accidentally short-circuited, the interlock mechanism will become incapable of operation.
   Moreover, when short-circuiting occurs between Pins 4 or 5 of CXA1081S (IC 1) and GND, or between Pin 29 of CXA1081S (IC 1) and GND, or between the terminals of Q1 (a Fault Condition will occur in all three cases), the laser diode will oscillate continuously.
   Note that during TEST Mode (see page 30), the interlock mechanism does not operate.
2. While the bonnet is in opened status, if the pickup is positioned to allow direct visibility of the objective lens at the outer periphery from the outer diameter of the disc clamper (80-mm diameter), the pickup can be flooded with radiation of more than class 1 of the laser optical system during any Fault Condition in Item 1 above or during TEST Mode.

2. SPECIFICATIONS

1. General

Type.....Compact disc digital audio system
Usable discs.....Compact Disc
Signal format.....Sampling frequency: 44.1 kHz
Quantized bit number: 16 bit linear
Power requirements
European models.....AC 220 V, 50/60 Hz
U.K., Australian models.....AC 240 V, 50/60 Hz
U.S., Canadian models.....AC 120 V, 60 Hz
Other models.....AC 110/120-127/220/240 V (switchable), 50/60 Hz
Power consumption.....11 W
Operating temperature.....+5°C - +35°C
Weight.....3.3 kg (7 lb, 4 oz)
External dimensions.....360(W) x 318(D) x 85(H) mm
14-1/5(W) x 12-1/2(D) x 3-3/10(H) in

2. Audio section

Frequency response.....4 Hz - 20 kHz (±1.0 dB EIAJ)
Signal-to-noise ratio.....98 dB or more (EIAJ)
Channel separation.....95 dB or more (EIAJ)
Output voltage.....2.0 V±0.5 V (EIAJ)
Wow and flutter.....Limit of measurement (±0.001% W.PEAK) or less (EIAJ)
Number of channels.....2 channels (stereo)

3. Output terminal

Audio line output

4. Functions

- Play
- Pause
- Manual search
- Programmed playback
- Track search
- Programmed repeat
- Pause program
- All track repeat
- Random play
- Timer start

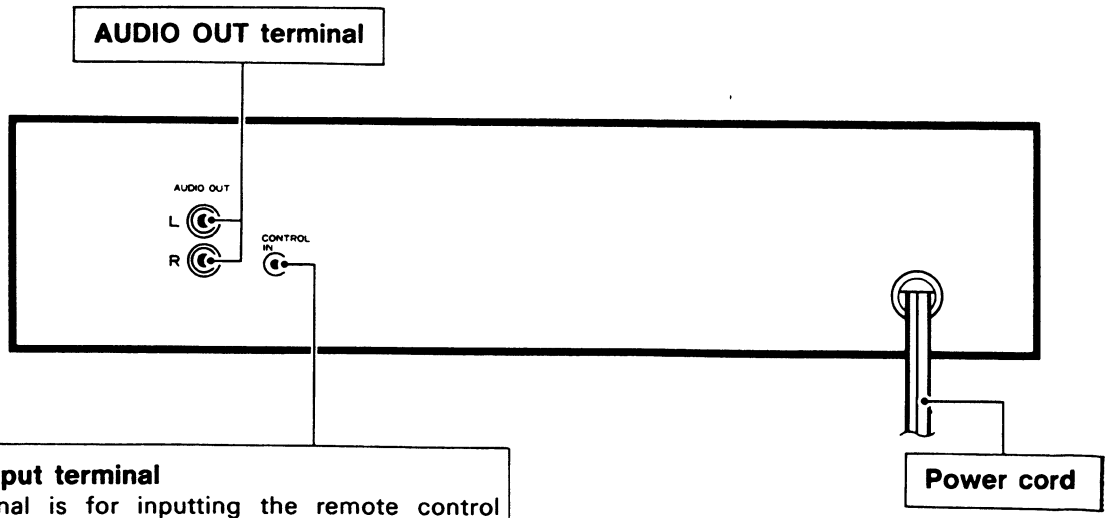
5. Accessories

- Output cable.....1
- Control cord.....1
- Operating instructions.....1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

3. PANEL FACILITIES

REAR PANEL



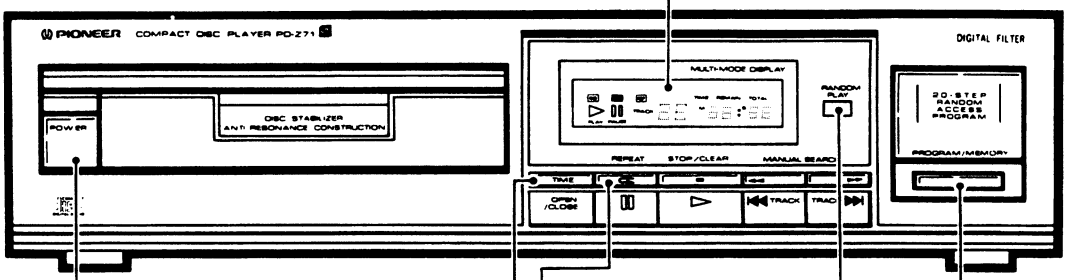
Control input terminal
This terminal is for inputting the remote control signals relayed from an amplifier or other component with a sensor for receiving control signals from a remote control unit and carrying the Pioneer SR mark. It allows CD synchronized recording, auto function, etc., to be performed. Please connect to the control output terminal of the stereo component. (RX-Z71L, RX-Z71, DC-Z81 or DC-Z91)

FRONT PANEL

Indicators:

REP : Lights during repeat play.
PGM : Lights after programming (after program has been memorized.)
RND : Lights during random playback.
TIME/REMAIN/TOTAL : Changes each time the TIME key is pressed.
- TIME : Displays the track number of the track being played, and the playback time (minutes and seconds).
- REMAIN : Indicates the time remaining on the track being played. When the TIME key is pressed again, the playing time remaining on the disc will be displayed.
- TOTAL : Displays the total number of tracks on one disc (TRACK) and the overall playback time (MIN, SEC). In case of a program, the total time of the program will be displayed.

TRACK : Indicates current track number, and track numbers within program.
M (MIN) : Displays the playback time, remain time or total time in minutes.
S (SEC) : Displays the playback time, remain time or total time in seconds.
▷ (PLAY) : Lights during playback.
▯▯ (PAUSE) : Lights during temporarily interrupt playback.



POWER switch
Press to turn power to the unit ON and OFF.
If there is a disc in the unit when power is turned ON, playback will begin automatically. (Timer start function)

TIME key
Use to select the method for displaying the playing time on the indicator panel.
Each time the key is pressed, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the explanation about the indicators.)

PROGRAM/MEMORY key
Used to program a sequence of tracks.
- Press this key after selecting a desired track with the TRACK SEARCH keys. Tracks will be added to the program in the order in which they are selected.

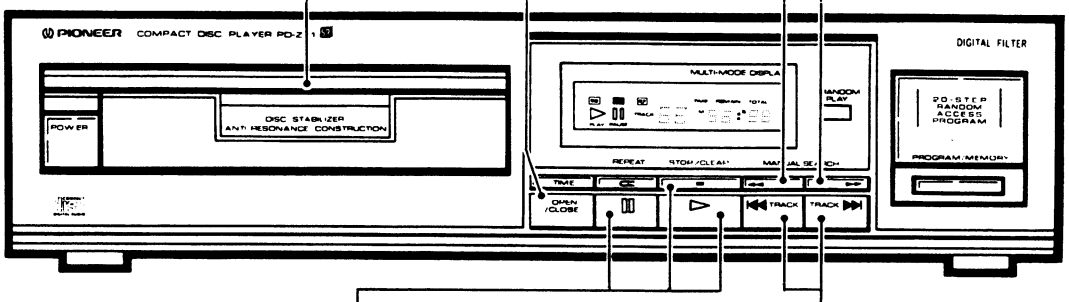
RANDOM PLAY key
Press to begin random playback.

REPEAT key (⊂)
Press to perform repeat playback
- If pressed during normal playback mode, all tracks on the disc will be repeatedly played back.
- If pressed during programmed playback, the programmed tracks will be repeatedly played back in the programmed order.

OPEN/CLOSE key
Press when you wish to eject or load a disc. Each time the key is pressed, the tray is alternately pushed out or pulled in.

Disc Tray
This is where the disc is set. When power is switched ON and the OPEN/CLOSE key is pressed, the tray is ejected forward.
To insert the tray, press the OPEN/CLOSE key, or lightly push the tray in with your finger. During play operation, pressing the PLAY key causes the tray to be inserted automatically.

MANUAL SEARCH keys
When the player is in play or pause modes, these keys are pressed to perform fast forward or fast backward operations, to allow manual searching.
These operations are only carried out during the time either key is pressed.
[▶▶] : Fast forward operation (If fast forward operation is performed to the end of the disc, " End" will be displayed and the player will enter pause mode.)
[◀◀] : Fast backward operation (If fast backward operation is performed to the beginning of the disc, the player will enter play mode.)
If these operations are performed during programmed play mode, the player will enter pause mode (or play mode)just before transferring to the next (or previous) step.



STOP (■)/CLEAR key
Press to stop playback. When pressed, the player goes into stop mode and all operations stop.
Press to clear a program. When pressed during stop mode, the program stored in memory is cleared.

PAUSE (▯▯) key
Press to temporarily interrupt playback. When pressed again, the pause mode is cancelled and playback resumes.

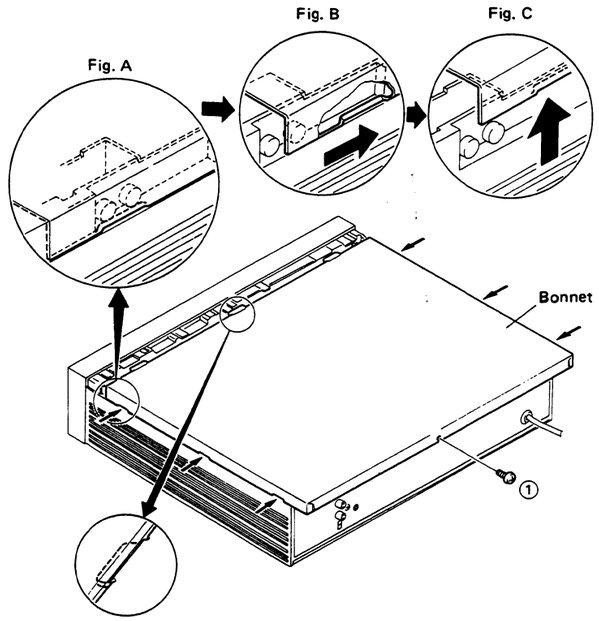
PLAY (▷) key
Press to begin playback, and to cancel the pause mode.

TRACK SEARCH keys
When the player is in the normal play, programmed play or pause modes, these keys are pressed to search for a desired track. Pressing either key causes the player to advance to the next track, or return to the previous track. Even in STOP mode, these keys can be used to select the desired track. Press the PLAY key to playback the desired track.
[▶▶|] : When pressed once, the disc playback advances to the beginning of the next track on the disc; when pressed continuously, the disc playback moves to the beginning of succeeding tracks on the disc. (During programmed playback, it moves to the beginning of the next programmed track.)
[|◀◀] : When pressed once, the disc playback returns to the beginning of the currently playing track; when pressed continuously, the disc playback moves further in reverse to the beginning of previous tracks on the disc. (During programmed playback it returns to the beginning of the previously programmed track.)

4. DISASSEMBLY

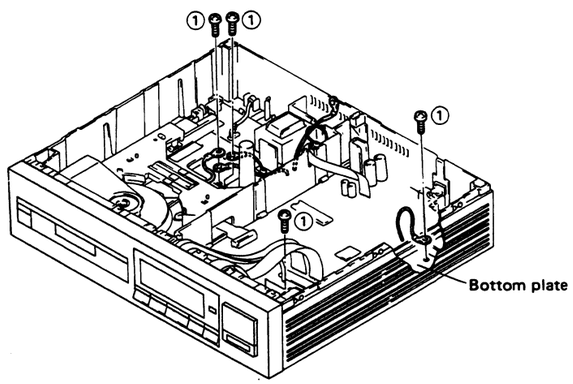
4-1. Bonnet

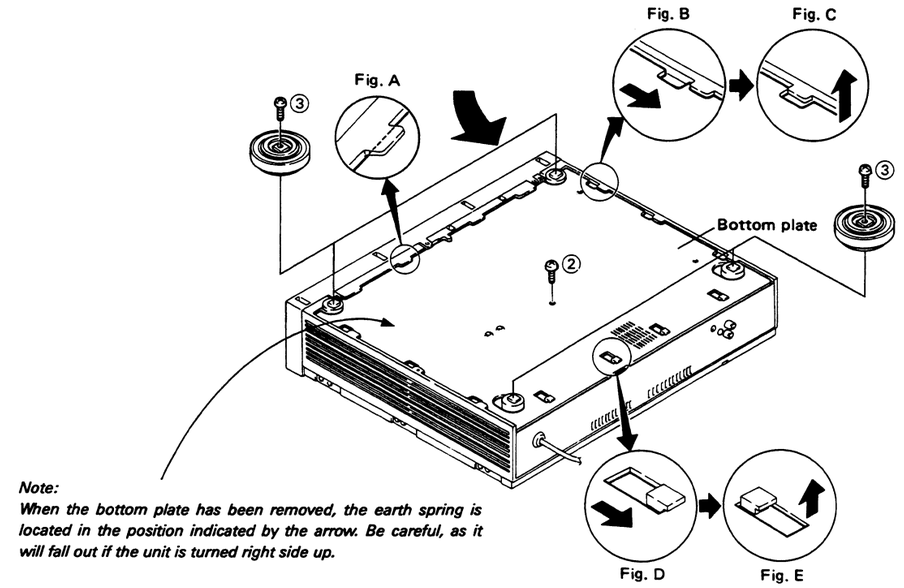
1. Remove a screw ① in the rear.
2. Slide the bonnet (Fig. A→Fig. B) and raise it (Fig. C).



4-2. Bottom Plate

1. Remove 4 screws ① inside to free GND leads and earth lod from the bottom plate.
2. Turn the set upside down. (See page 10.)
3. Remove a screw ② holding the bottom plate.
4. Slide the bottom plate backward. Make sure releasing of all stoppers (Fig. A → Fig. E).
5. Raise the bottom plate.

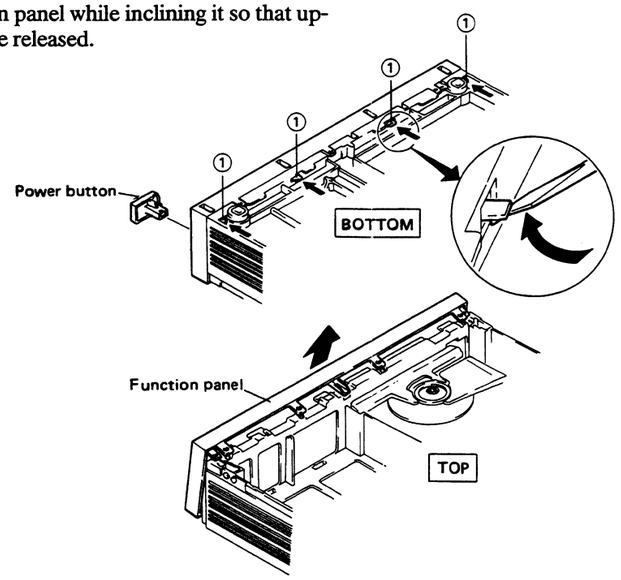




Note:
When the bottom plate has been removed, the earth spring is located in the position indicated by the arrow. Be careful, as it will fall out if the unit is turned right side up.

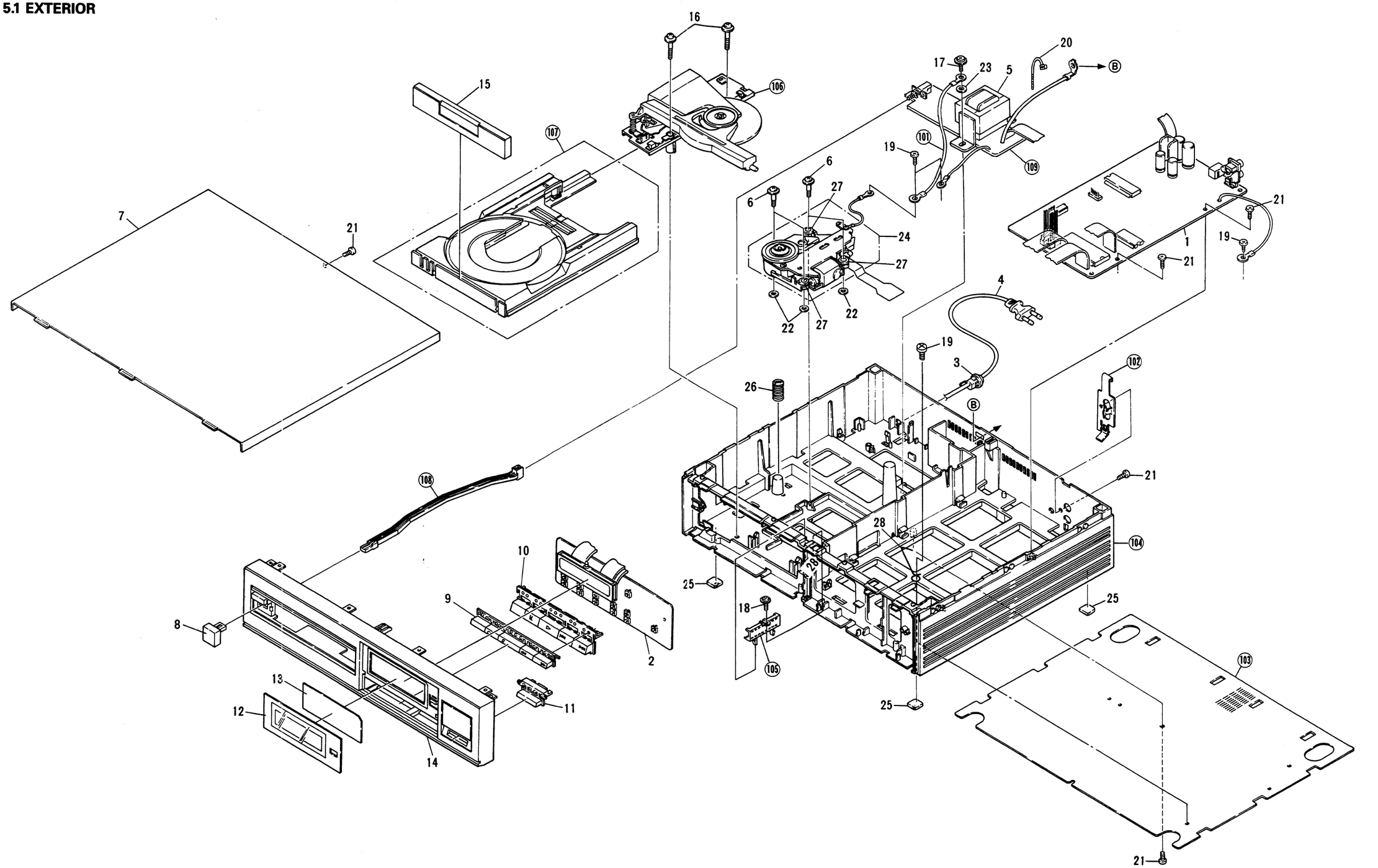
4-3. Function Panel

1. Pull out the disc tray, and remove the tray name plate.
2. Remove the SW joint, and remove the power button with the set placed upside down.
3. Release 4 claws ① outer sides first by using a flat screwdriver (raise lightly).
   Note: Take care not to break the claws.
4. Raise the function panel while inclining it so that upper 6 stoppers are released.



5. EXPLODED VIEWS AND PARTS LIST

5.1 EXTERIOR



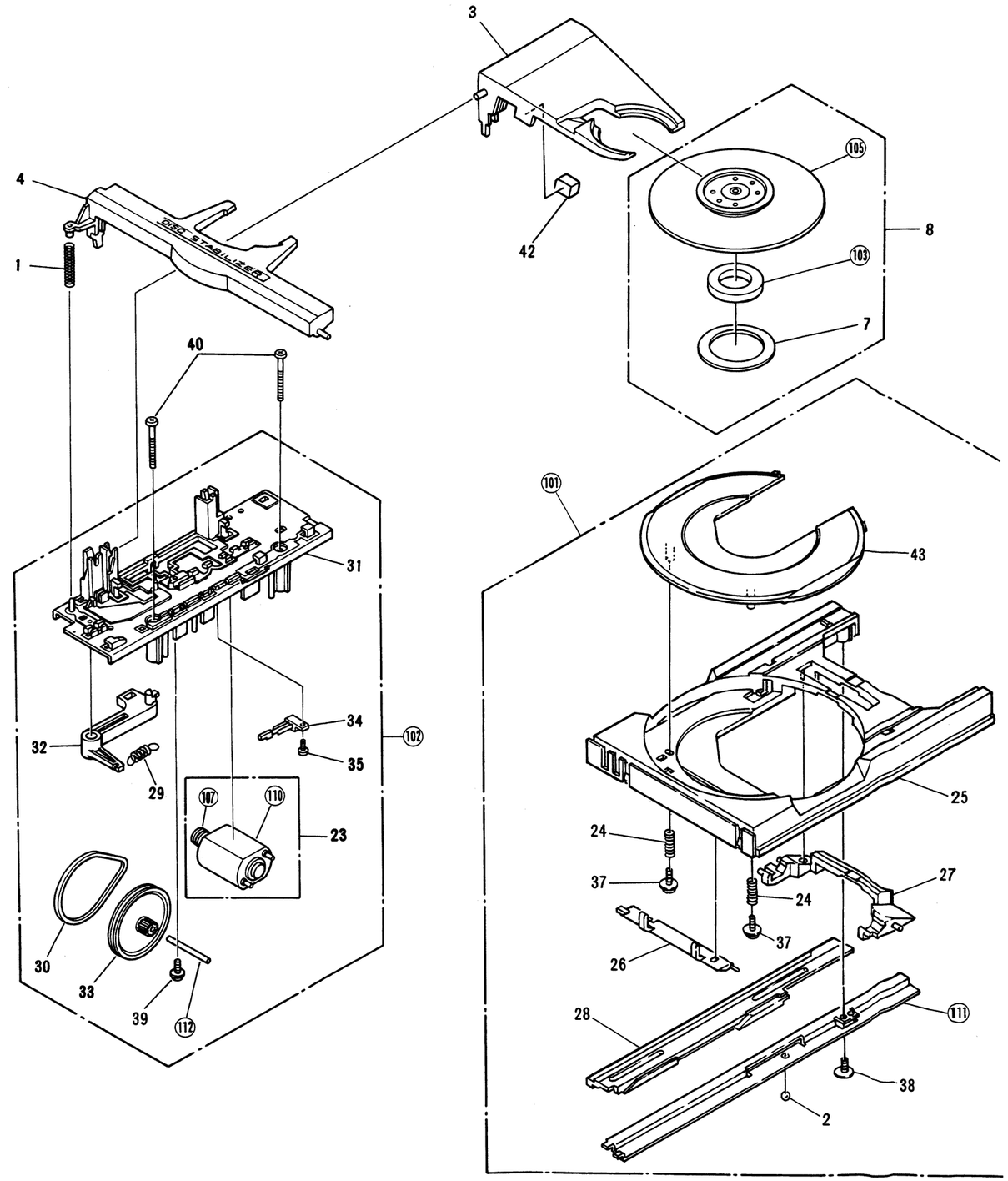
• Parts List

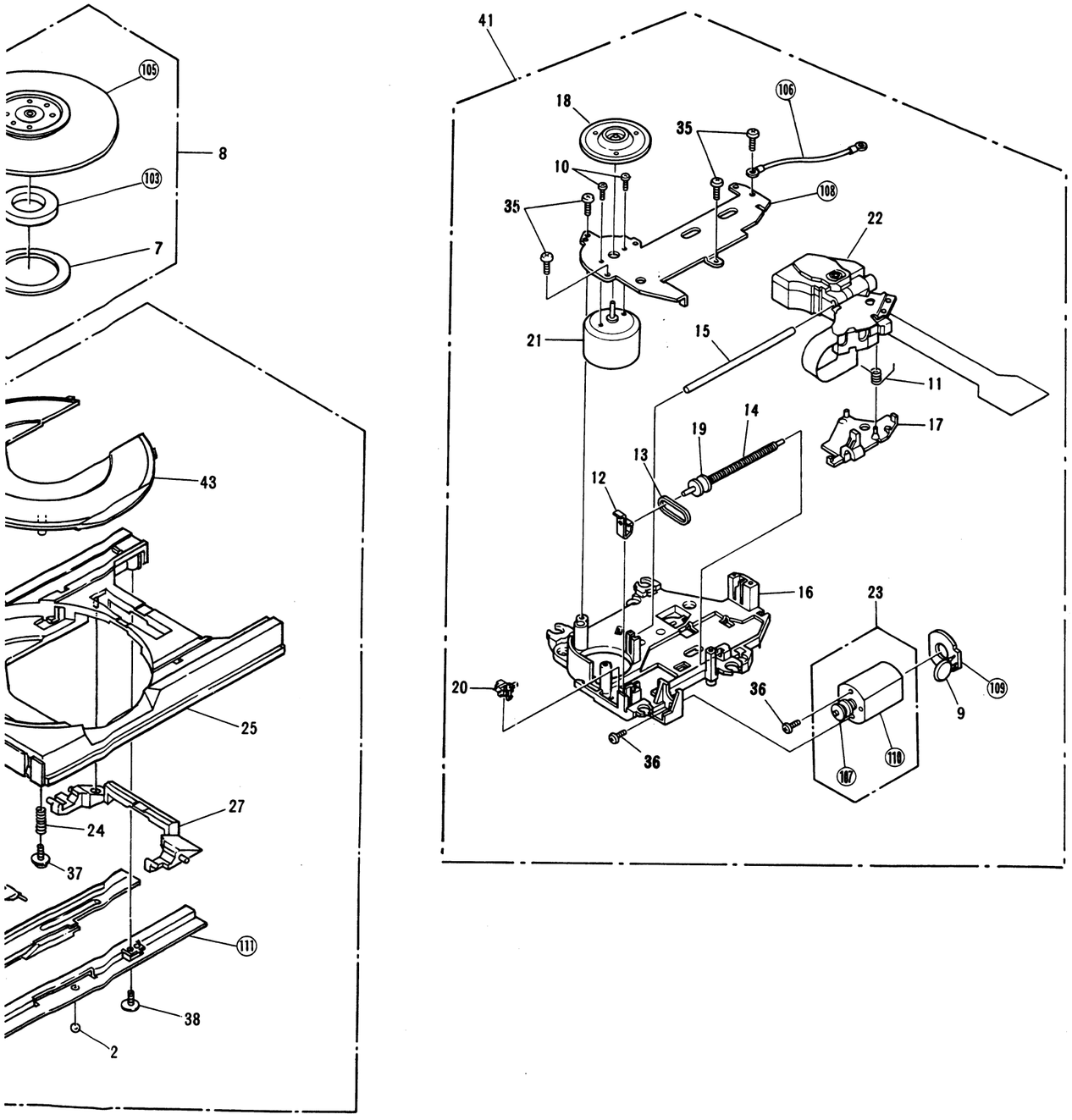
NOTES:
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

Mark	No.	Part No.	Description
⚠ ◉	1.	PWZ1352	Main board assembly
	2.	PWZ1353	Function board assembly
⚠ ◉	3.	CM-22B	Strain relief
⚠	4.	PDG1008	AC power cord
⚠ ★	5.	PTT1047	Power transformer
	6.	PBA1016	Screw
	7.	PNA1134	Bonnet
	8.	PAC1229	Power button
	9.	PAC1230	Function button (A)
	10.	PAC1231	Function button (B)
	11.	PAC1233	Program button
	12.	PAM1161	Display window (B)
	13.	PAM1162	FL filter
	14.	PNW1322	Function panel
	15.	PNW1325	Tray name plate
	16.	BPZ30P250FMC	Screw
	17.	IBZ40P140FMC	Screw
	18.	IPZ30P100FMC	Screw
	19.	PDZ30P050FMC	Screw
	20.	PEC-107	Binder
	21.	PPZ30P100FZK	Screw
	22.	WB30FMC	Washer
	23.	WH40FUC	Washer
	24.	PYY1063	Servo mechanism assembly
	25.	REB1004	Non-slip
	26.	PBH1031	Spring
	27.	PEB1014	Floating rubber
	28.	PBH1064	Earth lod

Mark	No.	Part No.	Description
	101.		GND lead unit
	102.		GND plate
	103.		Bottom plate
	104.		Main panel
	105.		Tray guide
	106.		Loading base assembly
	107.		Tray assembly
	108.		SW joint
	109.		Transformer baord assembly

5.2 MECHANISM ASSEMBLY

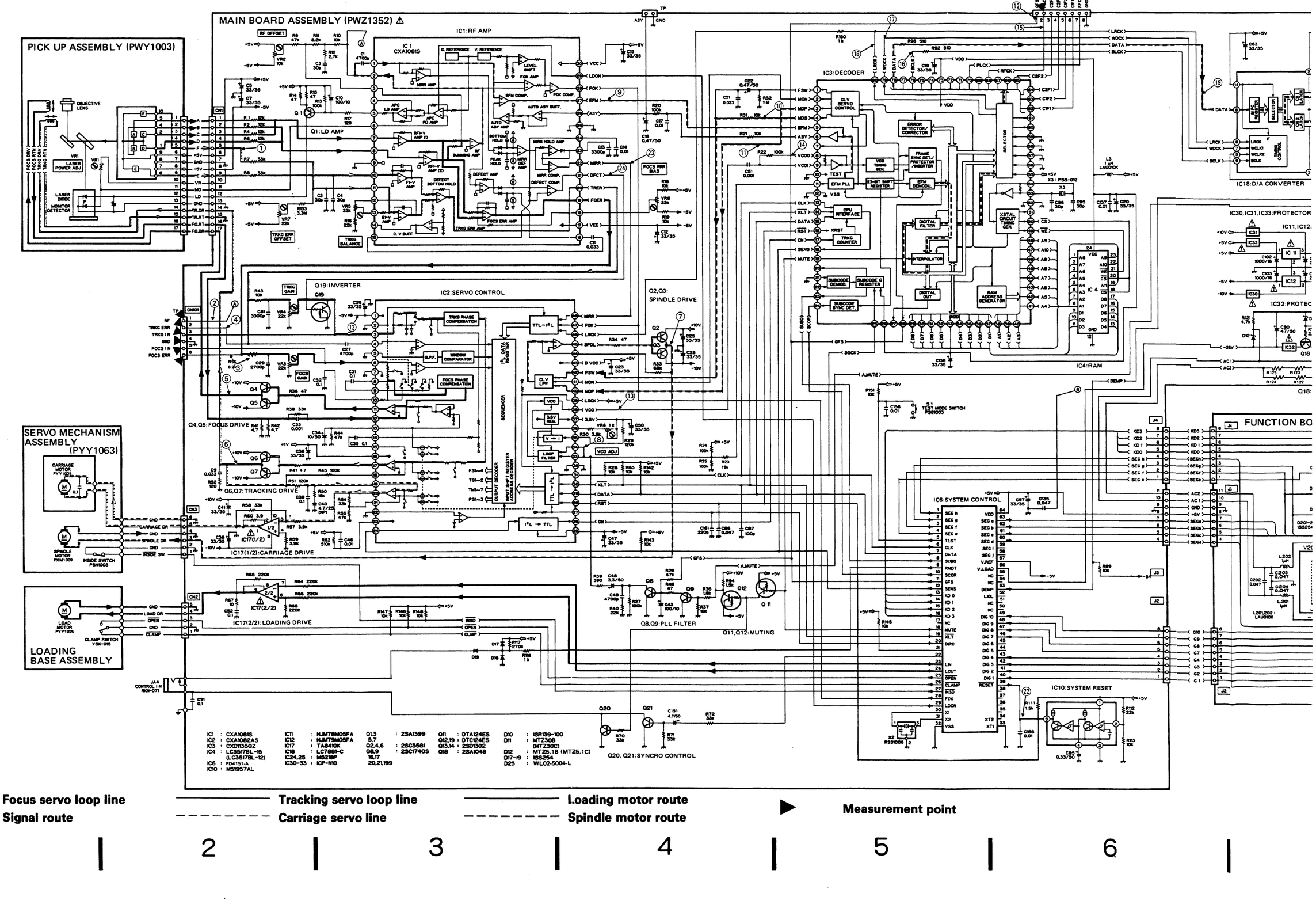


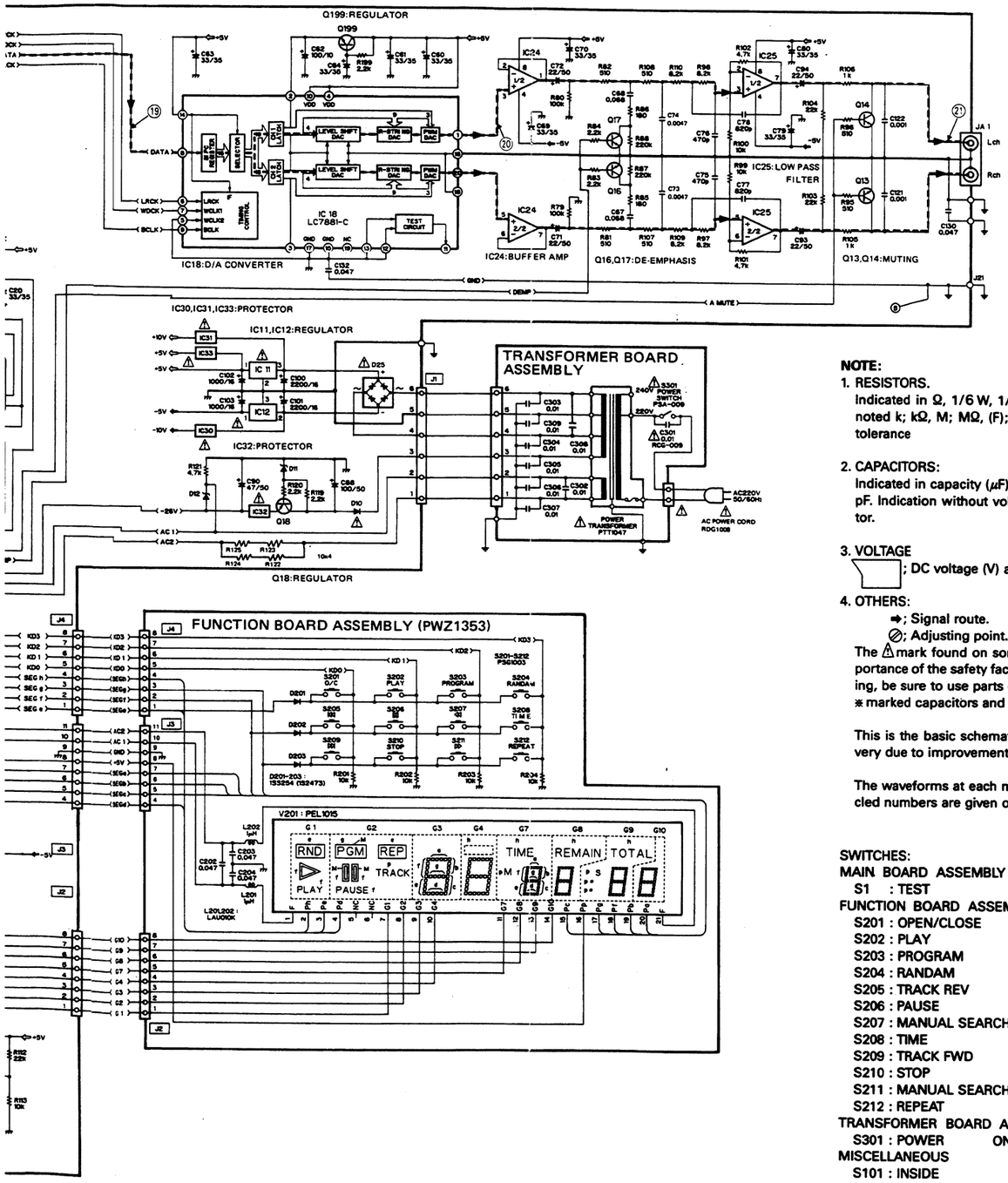


Parts List of Mechanism Section

Mark	No.	Part No.	Description
	1	PBH1013	Spring
	2	PBP-001	Steel ball ϕ4
	3	PNW1084	Clamp holder
	4	PNW1085	Clamp retainer
	5		.....
	6		.....
	7	PNM1010	Disc cushion
	8	PYY1028	Clamper assembly
	9	CGDYX104M25	Semiconductive ceramic capacitor
	10	PBA-209	Screw M2 x 3
	11	PBH1008	Drive spring
	12	PBK1010	Plate spring
★★	13	PEB1012	Belt (CARRIAGE)
	14	PLA1003	Drive worm
	15	PLA1004	Guide bar
	16	PNW1062	Mechanism chassis
	17	PNW1063	Carriage plate
	18	PNW1064	Disc table
	19	PNW1066	Pulley
★★	20	PSH1003	Slide switch (S101. INSIDE)
★★	21	PXM1009	Spindle motor
	22	PWY1003	Pick up assembly
★★	23	PYY1025	Motor assembly (CARRIAGE, LOADING)
	24	PBH1045	Spring
	25	PNW1390	Tray
	26	PNW1330	Plate lever (F)
	27	PNW1331	Plate lever (R)
	28	PNW1332	Rack
	29	PBH1012	Clamp spring
★★	30	PEB1013	Belt (LOADING)
	31	PNW1069	Loading base
	32	PNW1083	Clamp lever
	33	PNW1171	Gear pulley
★★	34	VSK-015	Leaf switch (S102. OPEN/CLMP)
	35	BPZ20P080FZK	Screw
	36	PMZ20P030FMC	Screw
	37	PBA1025	Screw
	38	PPZ30P080FMC	Screw
	39	IPZ30P060FMC	Screw
	40	BBZ30P250FMC	Screw
	41	PYY1063	Servo mechanism assembly
	42	PEB1032	Stopper rubber
	43	PNW1329	Disc plate
	101		Tray assembly
	102		Loading base assembly
	103		Magnet
	104		.....
	105		Clamper
	106		Earth lead unit
	107		Motor pulley
	108		Base plate
	109		Carriage M board
	110		Motor (LOADING, CARRIAGE)
	111		Slide base
	112		Gear shaft

6. SCHEMATIC DIAGRAM





NOTE:

1. RESISTORS.
   Indicated in Ω, 1/6 W, 1/8 W, ±5% tolerance unless otherwise noted k; kΩ, M; MΩ, (F); ±1%, (G); 2%, (K); ±10%, (M); ±20% tolerance

2. CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
   ; DC voltage (V) at no input signal

4. OTHERS:
   ➡; Signal route.
   ⊘; Adjusting point.

The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may very due to improvements in design.

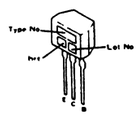
The waveforms at each measuring point indicated by the encircled numbers are given on pages 25 thru 27.

SWITCHES:
MAIN BOARD ASSEMBLY
S1 : TEST
FUNCTION BOARD ASSEMBLY
S201 : OPEN/CLOSE
S202 : PLAY
S203 : PROGRAM
S204 : RANDAM
S205 : TRACK REV
S206 : PAUSE
S207 : MANUAL SEARCH REV
S208 : TIME
S209 : TRACK FWD
S210 : STOP
S211 : MANUAL SEARCH FWD
S212 : REPEAT
TRANSFORMER BOARD ASSEMBLY
S301 : POWER ON - OFF
MISCELLANEOUS
S101 : INSIDE
S102 : CLAMP CLAMP - OPEN

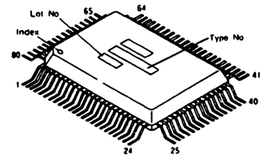
The underlined indicates the switch position.

External appearance of transistors and ICs

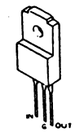
2SC1740S



CXD1135QZ



NJM78M05FA



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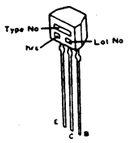
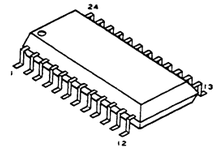


LC3517BL-15
LC3517BL-12



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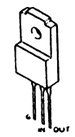

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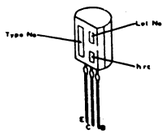
2SC3581



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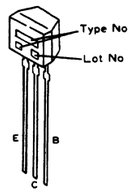
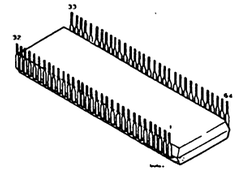
DTA124ES



PD4151-A



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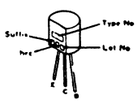
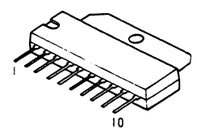
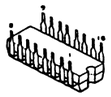


ICP-N10

TA8410K

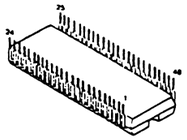


LC7881-C

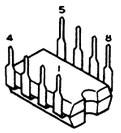


M51957AL

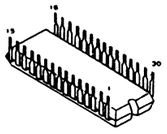
CXA1082AS



M5218P

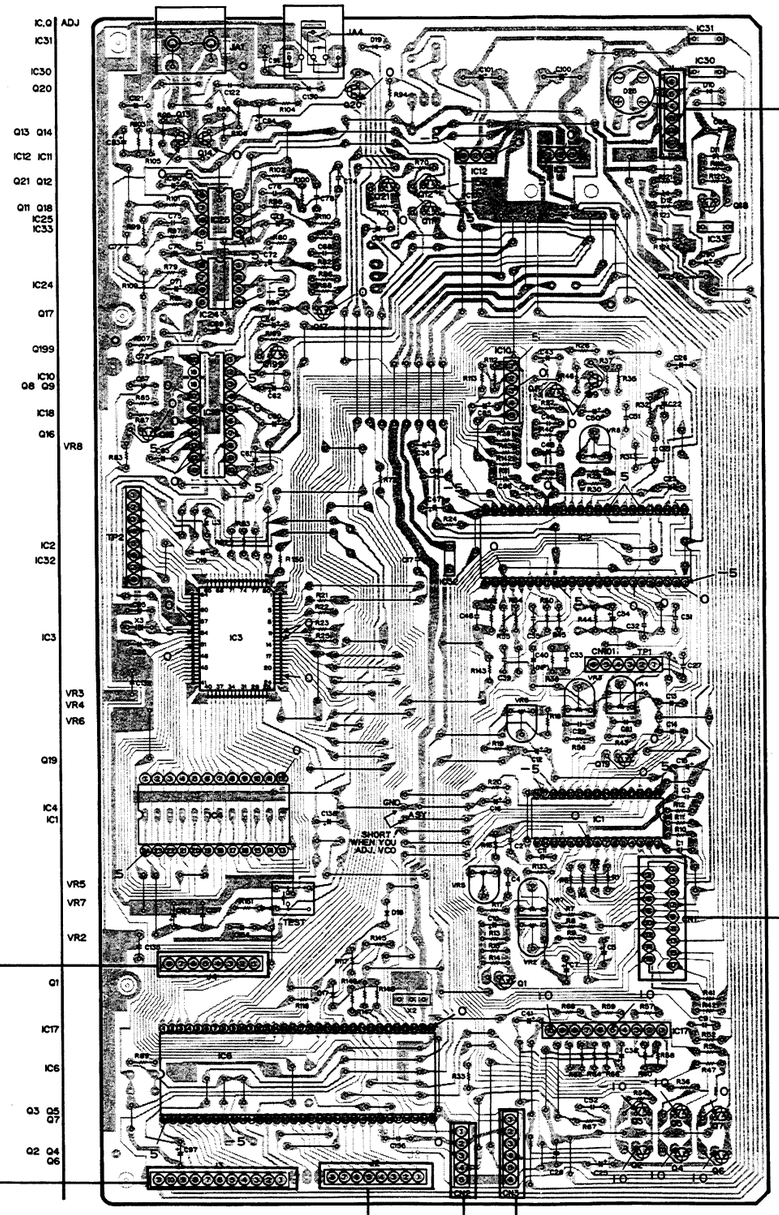


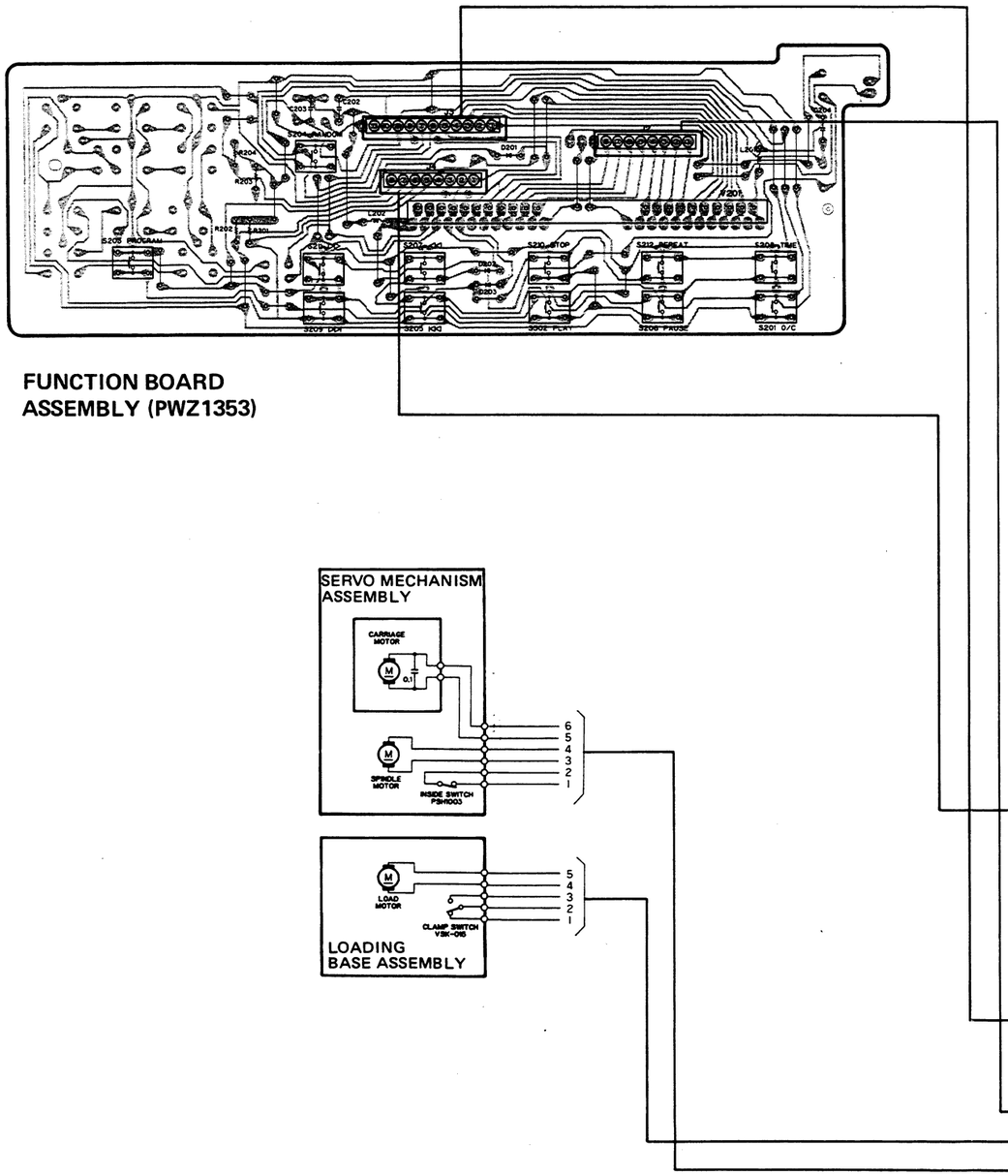
CXA1081S



7. P.C. BOARDS CONNECTION DIAGRAM

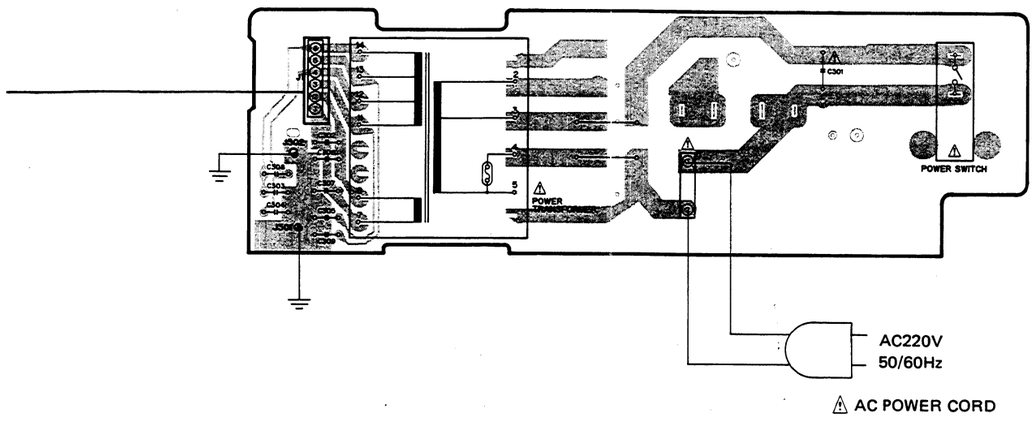
MAIN BOARD ASSEMBLY (PWZ1352)



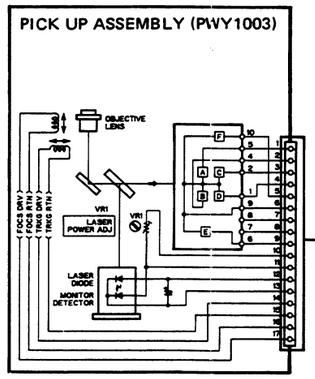


FUNCTION BOARD ASSEMBLY (PWZ1353)

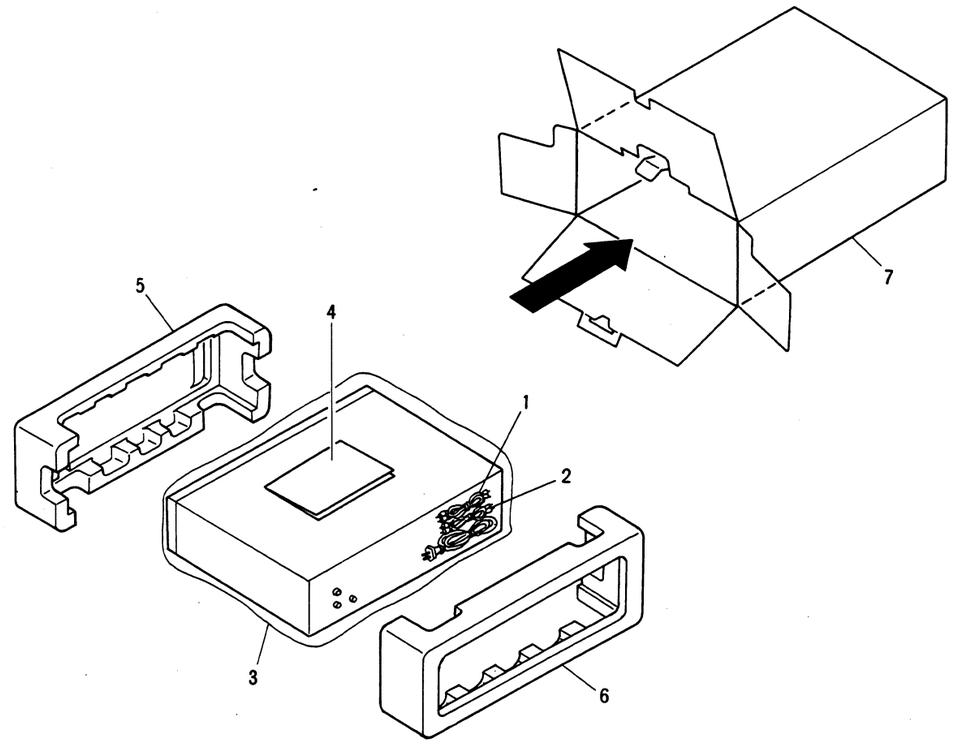
TRANSFORMER BOARD ASSEMBLY



PICK UP ASSEMBLY (PWY1003)



8. PACKING



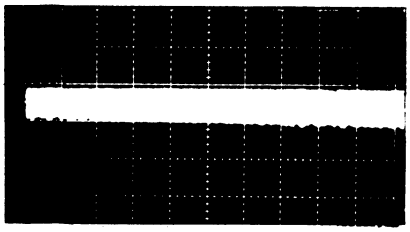
• Parts List of Packing

Mark	No.	Part No.	Description
	1.	PDE-319	Connection cord
	2.	PDE1023 (PDE1001)	Connection cord
	3.	Z23-007	Sheet
	4.	PRE1039	Operating instructions
	5.	PHA1047	Protector (F)
	6.	PHA1048	Protector (R)
	7.	PHG1161	CD packing case
	8.	PHC1012	Spacer (with in the tray)

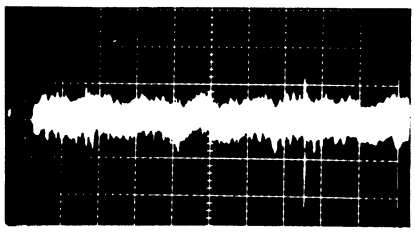
WAVE FORMS

NOTE: The encircled numbers denote measuring points in the circuit and pattern diagrams.

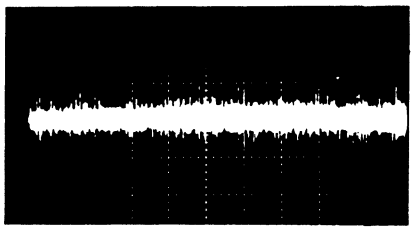
① CN1-5 Pin: PLAY MODE
100mV/Div 5m sec/Div



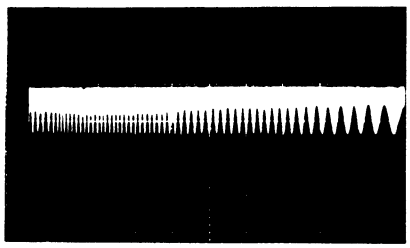
③ TP1-6 Pin: SEARCH MODE
500mV/Div 10mS/Div



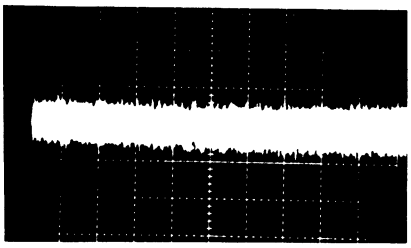
⑥ Q6E: PLAY MODE
2V/Div 10mS/Div



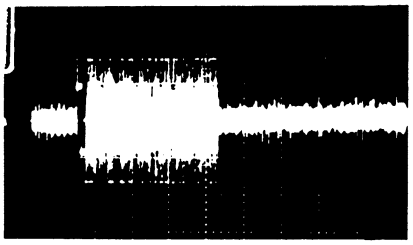
① CN1-5 Pin: SEARCH MODE
100mV/Div 5m sec/Div



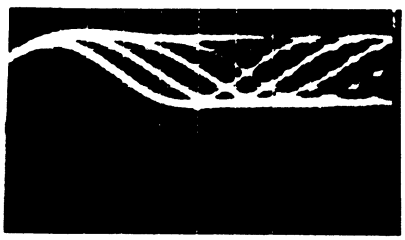
④ TP1-2 Pin: PLAY MODE
1V/Div 10mS/Div



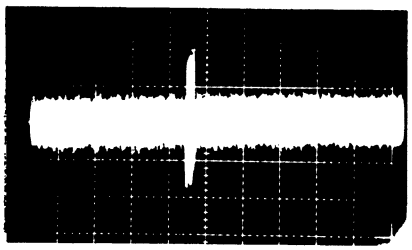
⑥ 6E: SEARCH MODE
2V/Div 10mS/Div



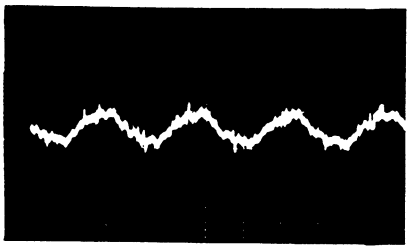
② TP1-1 Pin: PLAY MODE
1V/Div 200n sec/Div



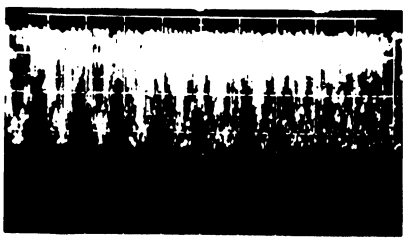
④ TP1-2 Pin: SEARCH MODE
1V/Div 10mS/Div



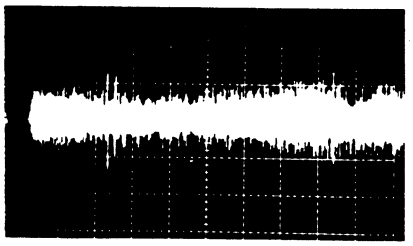
⑦ Q2E: PLAY MODE
2V/Div 50mS/Div



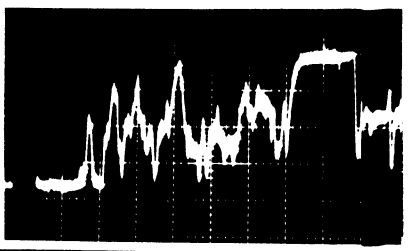
② TP1-1 Pin: SEARCH MODE
500mV/Div 5m sec/Div



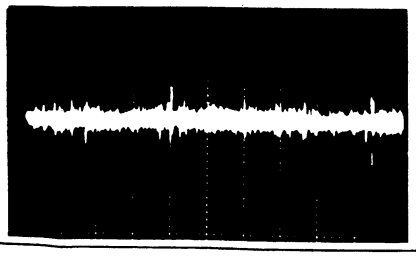
⑤ Q4 Emitter: PLAY MODE
2V/Div 10mS/Div



⑦ Q2E: SEARCH MODE
2V/Div 100mS/Div

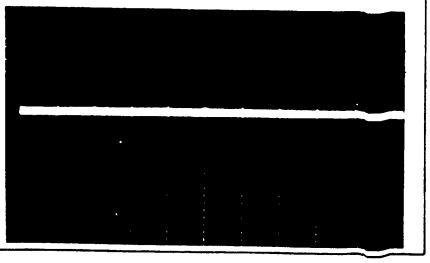


③ TP1-6 Pin: PLAY MODE
500mV/Div 10m sec/Div

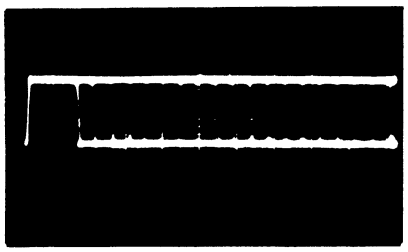


⑤ Q4E: SEARCH MODE
2V/Div 10mS/Div

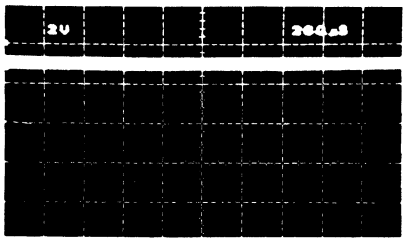
⑧ IC2, 34 Pin: PLAY MODE
2V/Div 10mS/Div



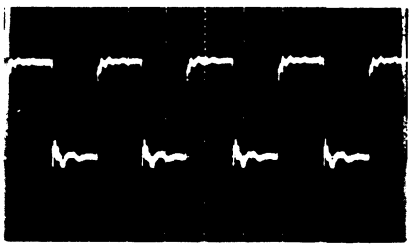
⑨ IC1 27 Pin: PLAY MODE
2V/Div 500n sec/Div



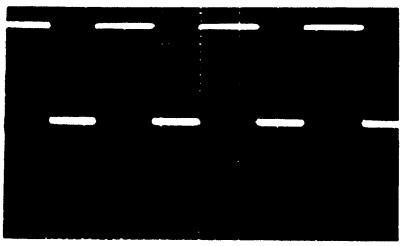
⑫ TP2-1: PLAY MODE
2V/Div 200μS/Div



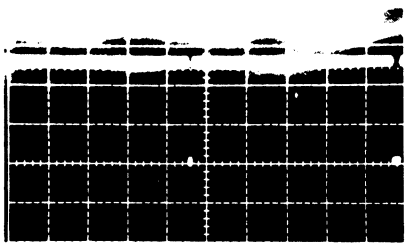
⑯ IC3-76: STOP MODE
2V/Div 200nS/Div



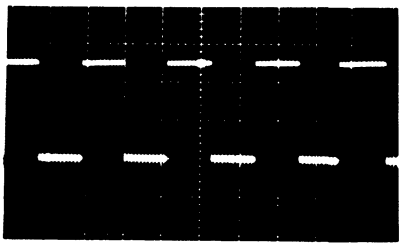
⑩ IC3-4: PLAY MODE
2V/Div 50μS/Div



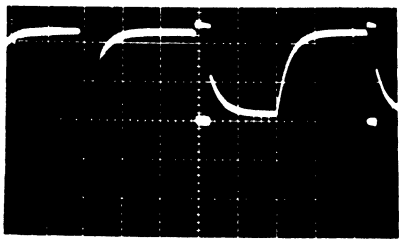
⑫ TP2-1: SEARCH MODE
2V/Div 20mS/Div



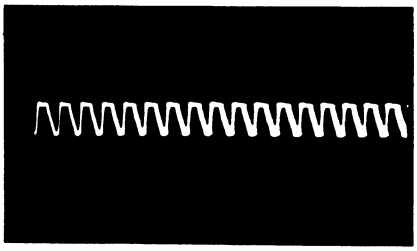
⑰ IC3-79: STOP MODE
2V/Div 5μS/Div



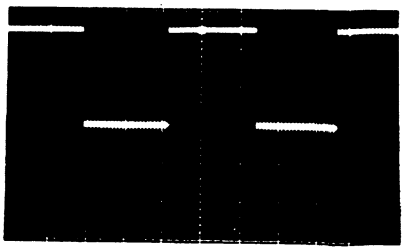
⑩ IC3-4: SEARCH MODE
2V/Div 100mS/Div



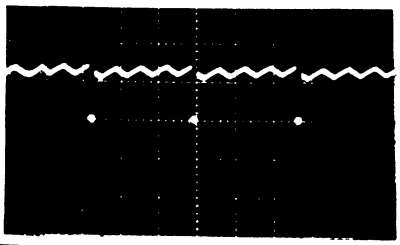
⑬ IC2-38: PLAY MODE
2V/Div 200μS/Div



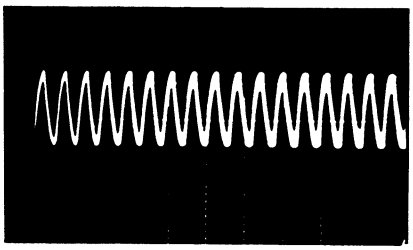
⑱ IC3-80: STOP MODE
2V/Div 5μS/Div



⑪ IC3-3: PLAY MODE
2V/Div 200μS/Div

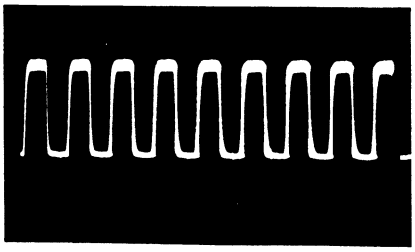


⑭ IC3-8: PLAY MODE
2V/Div 200μS/Div

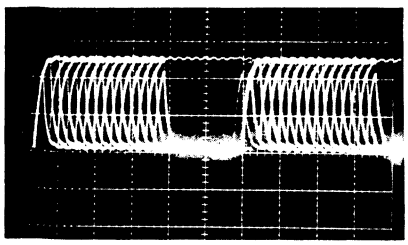


⑪ IC3-3: SEARCH MODE
2V/Div 10mS/Div

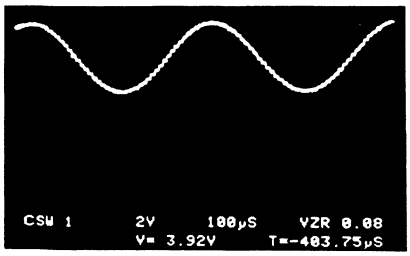
⑮ TP2-2: PLAY MODE
2V/Div 200μS/Div



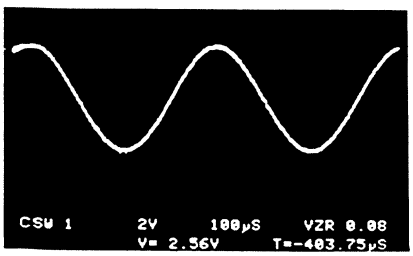
⑲ IC18-8:PLAY MODE
2V/Div 1μs/Div



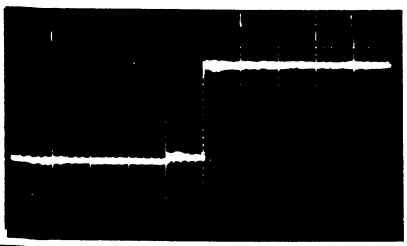
⑳ IC18-1:PLAY MODE
2V/Div 100μs/Div



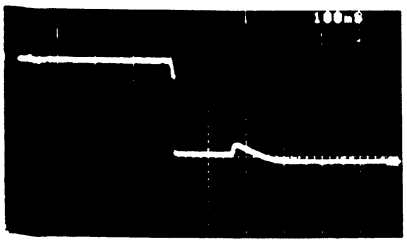
㉑ OUTPUT Lch:PLAY MODE
2V/Div 100μs/Div



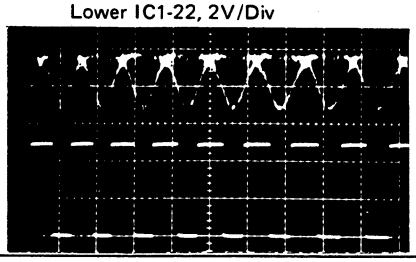
㉒ IC10-5: POWER ON
2V/Div 500mS/Div



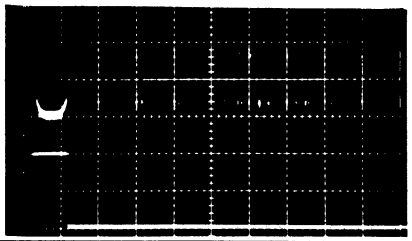
㉒ IC10-5: POWER-OFF
2V/Div 100mS/Div



㉓ IC1-22: TR OPEN
1mS/Div
Upper TP1-1, 1V/Div
Lower IC1-22, 2V/Div



㉔ IC1-21: DFCT
1mS/Div
Upper TP1-1, 1V/Div
Lower IC1-21, 5V/Div



9. ELECTRICAL PARTS LIST

NOTES:

- *Parts without part number cannot be supplied.*
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J = 5%, and K = 10%).

560Ω	*56 × 10¹*	*561*	*RD1/4PS 5 6 1 J*
47kΩ	*47 × 10³*	*473*	*RD1/4PS 4 7 3 J*
0.5Ω	*0R5*		*RN2H 0 R 5 K*
1Ω	*010*		*RS1P 0 1 0 K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62kΩ	*562 × 10¹*	*5621*	*RN1/4SR 5 6 2 1 F*

Miscellaneous Parts

Mark	Symbol & Description	Part No.
⚠ ◉	Main board assembly	PWZ1352
◉	Function board assembly	PWZ1353
	Transformer board assembly	
⚠	AC power cord	PDG1008
⚠ ★	Power transformer (AC220/240V)	PTT1047
⚠	Strain relief	CM-22B
★★	Spindle motor (SPINDLE)	PXM1009
★★	Motor assembly (LOADING, CARRIAGE)	PYY1025
★★ S101	Slide switch (INSIDE)	PSH1003
★★ S102	Leaf switch (OPEN/CLAMP)	VSK-015
★★	Pick-up assembly	PWY1003

Main Board Assembly (PWZ1352)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★★	IC1	CXA1081S
★★	IC2	CXA1082AS
★★	IC3	CXD1135QZ
★★	IC4	LC3517BL-15 (LC3517BL-12)
⚠ ★★	IC30 – IC33	ICP-N10
⚠ ★★	IC17	TA8410K
★★	IC18	LC7881-C
⚠ ★★	IC10	M51957AL
★★	IC24, IC25	M5218P
⚠ ★★	IC11	NJM78M05FA
⚠ ★★	IC12	NJM79M05FA
★★	IC6	PD4151-A
★★	Q11	DTA124ES
★★	Q12, Q19	DTC124ES
★★	Q18	2SA1048
★★	Q1, Q3, Q5, Q7	2SA1399
★★	Q8, Q9, Q16, Q17, Q20, Q21, Q199	2SC1740S
★★	Q2, Q4, Q6	2SC3581
★★	Q13, Q14	2SD1302
★	D11	MTZ30B (MTZ30C)
★	D12	MTZ5.1B
⚠ ★	D25	WL02-5004
⚠ ★	D10	1SR139-100
★	D17 – D19	1SS254

SWITCH

Mark	Symbol & Description	Part No.
★★ S1	Tact switch (TEST)	PSG1003

COIL

Mark	Symbol & Description	Part No.
L3	Axial inductor	LAU010K

CAPACITORS

Mark	Symbol & Description	Part No.
	C2 – C4, C95, C96	CCCCH300J50
	C87	CCCSL101J50
	C161	CCCSL221J50
	C40	CEANP4R7M25
	C85	CEASR33M50
	C16, C22	CEASR47M50
	C34	CEAS100M50
	C10, C43, C62	CEAS101M10
	C88	CEAS101M50
	C102, C103	CEAS102M16
	C71, C72, C93, C94	CEAS220M50
	C100, C101	CEAS222M16
	C48	CEAS3R3M50
	C5, C7, C12, C15, C19, C20, C23, C25, C26, C28, C36, C38, C41, C47, C50, C60, C61, C63, C64, C69, C70, C79, C80, C97, C138	CEAS330M35
	C151	CEAS4R7M50
	C90	CEAS470M50
	C73, C74	CFTXA472J50
	C67, C68	CFTXA683J50
	C52, C91	CGCYX104M25
	C137, C155, C156	CKCYF103Z50
	C86, C130, C132, C135	CKCYF473Z50
	C33, C51	CQMA102J50
	C14, C17, C46	CQMA103K50
	C31, C32, C35, C39	CQMA104K50
	C29	CQMA272J50
	C13, C81	CQMA332J50
	C9, C11, C21	CQMA333K50
	C75, C76	CQMA471J50
	C1, C27, C49	CQMA472K50
	C121, C122	CQSA102J50
	C77, C78	CQMA821J50

RESISTORS

Mark	Symbol & Description		Part No.
★	VR8	Semi-fixed (1kΩ)	VRTS6VS102
★	VR3 – VR7	Semi-fixed (22kΩ)	VRTB6VS223
★	VR2	Semi-fixed (10kΩ)	VRTB6VS103
	R30	Metal thin film	RN1/6PQ3601F
		Other resistors	RD1/6PM□□□J

OTHERS

Mark	Symbol & Description		Part No.
	JA1	2P pin jack (AUDIO OUT)	PKB1003
	JA4	3.5ø mini jack (CONTROL IN)	RKN-071
★	X3	Crystal resonator (8.4672MHz)	PSS-012
★	X2	Ceramic resonator (4.19MHz)	RSS1006

Function Board assembly (PWZ1353)

SEMICONDUCTORS

Mark	Symbol & Description	Part No.
★	D201 – D203	1SS254 (1S2473)

SWITCHES

Mark	Symbol & Description	Part No.
★★	S201 – S212 Tact switch (OPERATION)	PSG1003

COILS

Mark	Symbol & Description	Part No.
	L201, L202 Axial inductor	LAU010K

CAPACITORS

Mark	Symbol & Description	Part No.
	C202 – C204	CKCYF473Z50

RESISTORS

Mark	Symbol & Description	Part No.
	R201 – R204	RD1/6PM103J

OTHERS

Mark	Symbol & Description		Part No.
★	V201	Fluorescent tube	PEL1015

Transformer Board assembly

SWITCH

Mark	Symbol & Description		Part No.
⚠ ★★	S301	Power switch	PSA-009

CAPACITORS

Mark	Symbol & Description		Part No.
	C302 – C309		CKCYF103Z50
⚠	C301	(0.01μF/AC400V)	RCG-009

10. ADJUSTMENT

The adjustments for this unit are given below. Adjustments must be made in the order in which they are listed.

• ADJUSTMENTS AND CHECK ITEMS

1. Tracking offset, focus offset and RF offset adjustment
2. RF level adjustment
3. LD (laser diode) power check
4. Focus lock and spindle lock check
5. Grating adjustment
6. Tracking balance adjustment
7. Tangential adjustment
8. Focus gain adjustment
9. Tracking gain adjustment
10. VCO free run frequency adjustment
11. Method for confirming S character

• REQUIRED EQUIPMENT

1. Dual trace oscilloscope
2. Optical power meter
3. Test disc (YEDS-7)
4. Loop gain adjustment filter
5. Signal generator
6. Frequency counter
7. Other regular measuring equipment

• ABOUT THE TEST MODE

All adjustments must be carried out with the unit in the test mode.

How to activate and release the test mode

① To activate the test mode, turn ON the power switch (S301) with the test mode switch (S1) in the ON position.

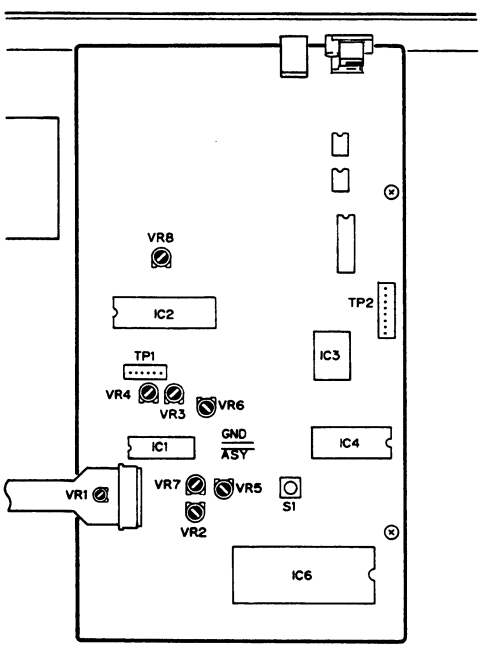
② The test mode is released by turning the power switch OFF.

The functions of the keys in the test mode are outlined in Table 10-1.

• ADJUSTMENT VRs AND THEIR NAMES

VR1: Laser power
VR2: RF offset (RF.OFS)
VR3: Focus gain (FOCS.GAN)
VR4: Tracking gain (TRKG.GAN)
VR5: Tracking balance (TRKG.BAL)
VR6: Focus offset (FOCS.OFS)
VR7: Tracking offset (TRKG.OFS)
VR8: VCO adjust (VCO.ADJ)

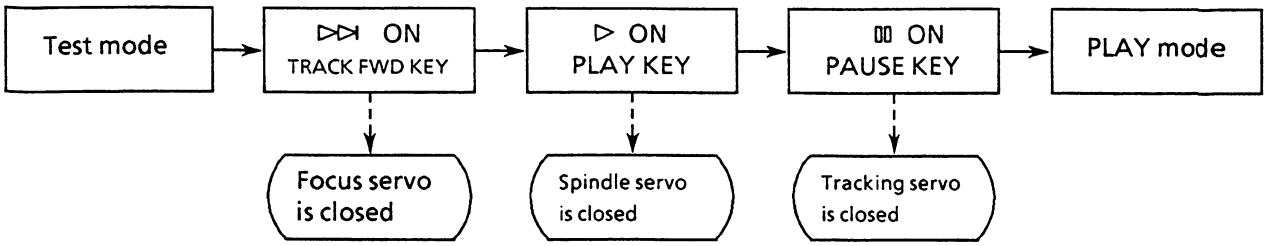
Adjustment Point



In the test mode, the servos must be closed and opened individually. Consequently, the servos must each be closed in the proper sequence (serial sequence) in order to put the machine into the play mode. Note also that the machine will not enter the play mode when the PAUSE (▯▯) key is pressed.

For example, in order to change from the stop to the play mode, the function keys must be pressed in the following order.

* In the test mode, the servos must be operated in serial sequence.

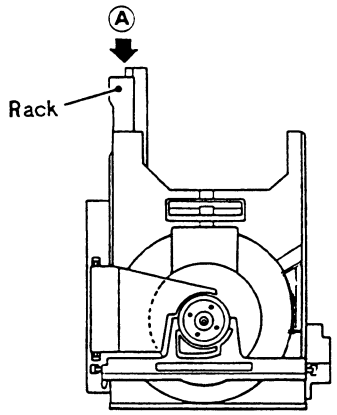
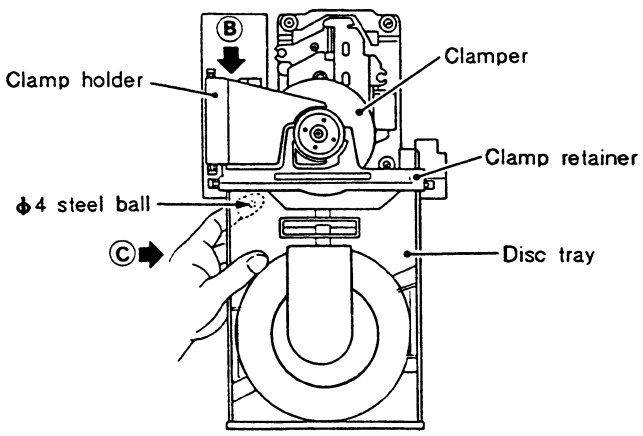


• KEY FUNCTIONS IN THE TEST MODE

Symbol	Key name	Function in test mode	Description
▷▷|	TRACK FWD	Focus servo close	Turns ON the laser diode, and raises and lowers the focusing actuator to close the focus servo.
▷	PLAY	Spindle servo close	Closes the servo in the CLV-A mode after kicking the spindle motor.
▯▯	PAUSE	Tracking servo close/open	Acts as a toggle: closes the tracking servo and activates play mode when pressed (provided the focus and spindle servos are closed), at which time the PAUSE indicator illuminates; opens the tracking servo when pressed again.
▷▷	MANUAL SEARCH REV	Carriage reverse (moves inward)	Moves carriage quickly (3cm/s) toward innermost track. Be careful not to move too far as there is no safety device to stop the carriage.
◁◁	MANUAL SEARCH FWD	Carriage forward (moves outward)	Moves carriage quickly (3cm/s) toward outermost track. Be careful not to move too far as there is no safety device to stop the carriage.
□	STOP	Stop	Stops all servos and returns system to its initial state.
⏏	OPEN / CLOSE	Disc tray open/close	Opens and closes the disc tray. However, pickup does not return to rest on OPEN, and it remains stationary on CLOSE.

Table 10-1.

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
1	**Tracking offset, focus offset and RF offset adjustment**					
			TP1 Pin 2 (TRKG. ERR)	VR5 (TRKG. BAL) VR7 (TRKG. OFS)	Tracking offset 45 ° 0V ± 50mV	• Put unit in the test mode (see page 28). • Set VR5 TRKG. BAL (tracking balance) to the position about 45 ° to the left of center. • Adjust VR7 TRKG.OFS (tracking offset) so that the TRKG.ERR (tracking error) voltage at TP1 pin 2 becomes 0 V ± 50 mV.
			TP1 Pin 6 (FOCS. ERR)	VR6 (FOCS. OFS)	Focus offset 0V ± 50mV	• Adjust VR6 FOCS.OFS (focus offset) so that the FOCS.ERR (focus error) voltage at TP1 pin 6 becomes 0 V ± 50 mV.
			TP1 Pin 1 (RF. OUT PUT)	VR2 (RF. OFS)	RF offset 100mV ± 50mV	• Adjust VR2 RF.OFS (RF offset) so that the RF output voltage at TP1 pin 1 becomes 100mV ± 50 mV. *Note: When adjusting the tracking offset, always perform "6. Tracking Balance Adjustment."*
2	**RF level adjustment**					
			TP1 Pin1 (RF OUT PUT)	VR1 (Laser power)	1.5V $^{+0.2V}_{-0V}$	• Put unit in the test mode (see page 28). • Connect the oscilloscope to TP1 pin 1 (RF output), play the test disc, and measure the P-P voltage of the RF waveform. • Adjust VR1 (Laser power) so that the voltage is 1.5V $^{+0.2V}_{-0V}$.
3	**LD (laser diode) power check**					
					Less than 0.13mW	• Put unit in the test mode (see page 28). • Press the TRACK FWD (⊳⊳|) key to turn ON the laser diode. • Place the sensor of the optical power meter directly above the objective lens and confirm that LD power does not exceed 0.13mW.

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
4	**Focus lock and spindle lock check**					
	V 0.5V / div	H 100 msec / div	TP1 pin1 (RF output)		RF signal is output Forward (clockwise) rotation	• Set the test disc. • Put unit in the test mode (see page 28). • Press the MANUAL SEARCH FWD (▷▷) key to move the pickup to the center of the disc. • Observe the output of TP1 pin 1 (RF output) on the oscilloscope. Confirm that the RF signal is output after the TRACK FWD (▷▷|) key is pressed. • Press the PLAY (▷) key and confirm that the disc rotates at constant speed (approx. 30 rpm near center of disc) in the forward (clockwise) direction; disc may not run away or rotate counterclockwise.
5	**Grating adjustment (1)**					
	 Fig. 10-1  Fig. 10-2					Remove the disc tray before beginning this adjustment. • Removal of the disc tray 1. Press the rear edge of the rack, (*1) marked Ⓐ in Fig. 10-1, while pulling the disc tray out to the position where it catches, illustrated in Fig. 10-2. (*1) When the rear edge of rack (A) is pressed, first the disk clamp is released. If you continue pressing after it has been released completely, the disk tray is ejected. 2. While pulling the clamp holder Ⓑ (see Fig. 10-2) upward with the right hand, hold the tray as indicated by Ⓒ in the left hand and pull it outward. Take care not to allow the ϕ4 steel ball to fall (we recommend holding the ball in place with the left index finger while extracting the tray.)

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure

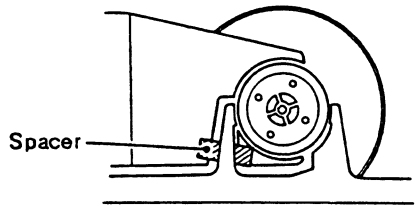


Fig. 10-3

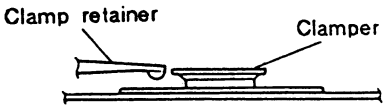


Fig. 10-4

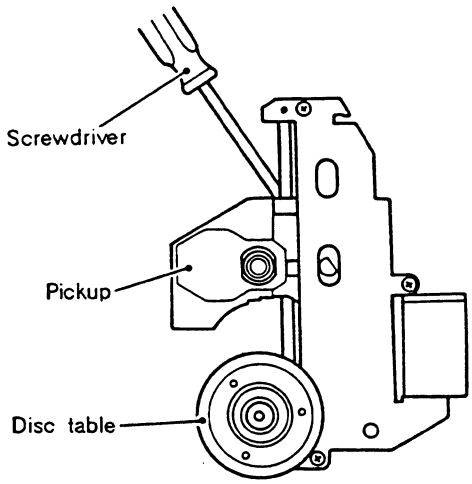


Fig. 10-5

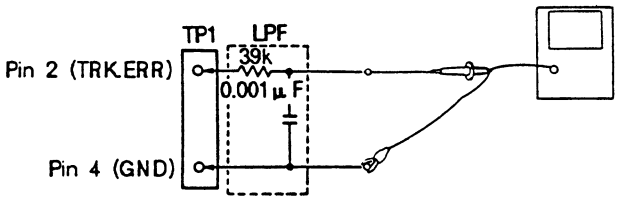


Fig. 10-6

- Put unit in the test mode (see page 28).
- Press the MANUAL SEARCH FWD (▷▷) key to move the pickup to the vicinity of what would be the center of the disc. Position the pickup so its grating adjusting screw is visible through the elongated hole on the spindle motor side of the servo mechanism base plate.
- As shown in Fig. 10-5, insert a (slotted) ⊖ screwdriver from the rear of the mechanism and check that the grating adjusting screw can be rotated.
- Mount the test disc; be sure to insert a 3-5 mm spacer (if no spacer is available, use a hex wrench) between the clamp holder and clamp retainer, as shown in Fig. 10-3.
- Confirm that the clamper and the clamp retainer are not contacting one another (Fig. 10-4).
- Press the TRACK FWD (▷▷|) and the PLAY (▷) keys sequentially to close the focus and spindle servos (do not close the tracking servo).
- Insert a 4 kHz-cutoff low pass filter between the oscilloscope and TP1 pins 2 (TRKG.ERR) and 4 (GND) as shown in Fig. 10-6 and observe the waveform of TP1 pin 2 (tracking error) on the oscilloscope.

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
	0.5V / div	5ms / div	TP1 Pin 2 TRKG. ERR	Grating adjusting screw Grating adjusting screw	Null point Max. amplitude	• Turn the grating adjusting screw with the ⊖ screwdriver to find the null point (see Photo 10-1). • Next, slowly turn the ⊖ screwdriver COUNTERCLOCKWISE and adjust to the point where the waveform (tracking error signal) first achieves its maximum amplitude (see Photo 10-3). *Note: Avoid applying pressure to the ⊖ screwdriver while adjusting the screw. Doing so causes the pickup to move inward, making adjustment more difficult.* • Lastly, remove the low pass filter and confirm that the tracking error signal p-p voltage does not greatly vary when the pickup is moved to the inner-most and outer-most tracks of the disc. If the levels diverge by ± 10% or more, re-adjust the maximum error amplitude point by turn the grating adjusting screw.

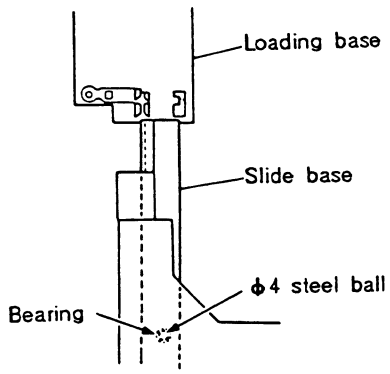


Fig. 10-7

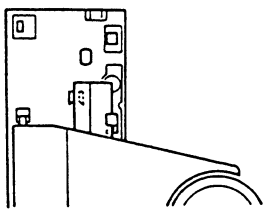


Fig. 10-8

Re-mount the disc tray according to the following procedure when the grating adjustment is complete.

1. Remove the disc and the spacer.
2. While lifting the clamp holder [marked Ⓑ in Fig. 10-2] with the right hand, hold the tray in the left hand as indicated by Ⓒ and slide the slide base into the hard resin fittings on the loading base as shown in Fig. 10-7 to re-insert the disc tray. At this time, be sure to hold the steel ball in place with the index finger of the left hand. Also, be careful that the front panel is not damaged by the slide base and bearing of the steel ball's bearing (in the slide base) coming into contact with the panel.
3. Insert the slide base so that it fits into the two hard resin fittings at the rear of the loading base (see Fig. 10-8).
4. Insert the tray tightly.

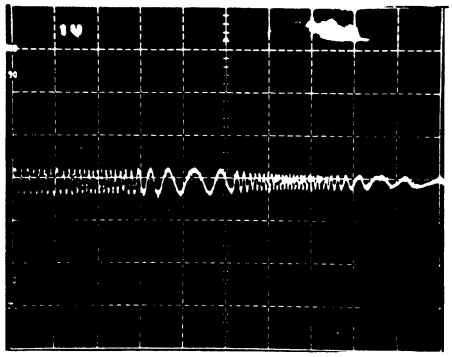


Photo 10-1 Null point

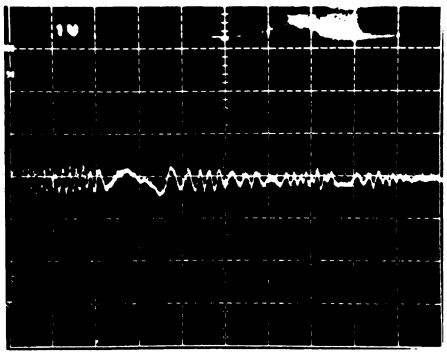


Photo 10-2 This is not the null-point waveform.

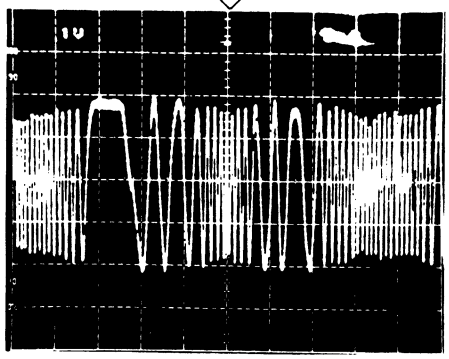


Photo 10-3 Maximum amplitude

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
5	Grating Adjustment (2) (using discs with a recording time of 60 min. or more)					
	0.5V / div	5ms / div	TP1 Pin 2 (TRKG. ERR)	Grating	Null point	
				Grating	Maximum amplitude	

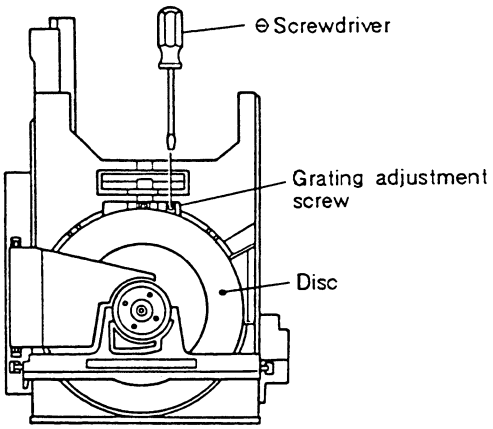


Fig. 10-9

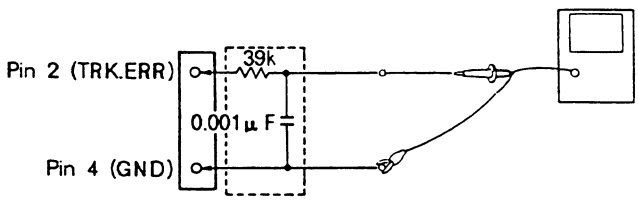


Fig. 10-10

Note: This adjustment can only be performed with a disc having pits up to R115mm, not with the Test Disc (YEDS-7).

- Put unit in the test mode (see page 28).
- Load the test disc, move the pickup to the outer periphery so that the pickup grating adjustment hole is visible from the pit surface of the disc or from the hole in the servo mechanism (see Fig. 10-9).
- Press the TRACK FWD key (▷▷|) and PLAY key (▷) in sequence to close the focus servo and spindle servo (do not turn on the tracking servo).
- Observe the TRKG.ERR (tracking error) waveform at TP1 pin 2 on an oscilloscope, inserting a 4 kHz low-pass filter (see Fig. 10-10).
- Insert a ⊖ screwdriver into the grating hole, turn and find the null point (see Photo 10-1).
- Next, slowly turn the ⊖ screwdriver COUNTERCLOCKWISE from the null point and adjust until the waveform (tracking error signal) reaches maximum amplitude (see Photo 10-3).

Note: Use caution since inserting the ⊖ screwdriver forcefully will cause the pickup unit to float upward.

- Lastly, make sure that there is no major fluctuation in the p-p voltage of the tracking error signal (do not insert the cutoff 4 kHz low-pass filter) when the pickup is moved to the inner periphery and when the pickup is moved to the outer periphery. If there is a difference of more than ± 10 % again turn the grating adjustment screw and adjust the tracking error signal to maximum.

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
6	Tracking balance adjustment					
	0.5V / div	5ms / div	TP1 Pin 2 (TRKG. ERR)	VR5 (TRKG.BAL)		• Load the test disc. • Put unit in the test mode (see page 28). • Press the MANUAL SEARCH FWD (▷▷) key to position the pickup near the center of the disc. • Press the TRACK FWD (▷▷|) and PLAY (▷) keys sequentially to cause the disc to rotate. • Observe TP1 pin 2 TRKG.ERR (tracking error) on the oscilloscope and adjust VR5 TRKG.BAL (tracking balance) to eliminate the DC elements from the tracking error signal.
7	Tangential adjustment					

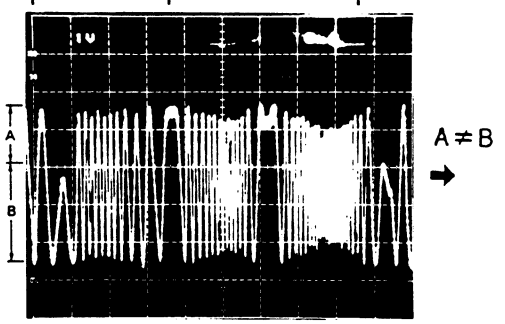


Photo 10-4 DC elements mixed in signal

A= B

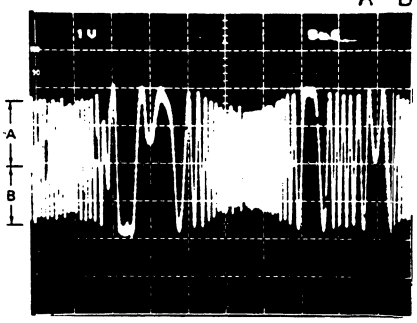
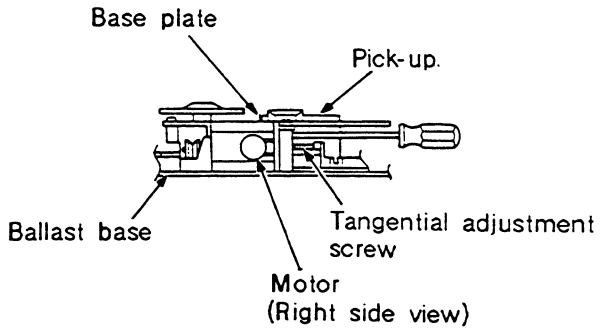


Photo 10-5 DC elements eliminated



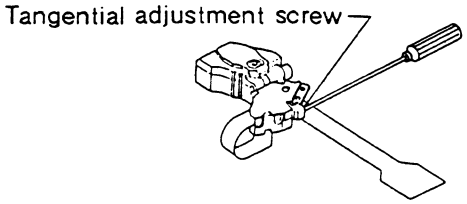


Fig. 10-11

- Put unit in the test mode (see page 28).
- Open the tray and load the test disc.
- Press the MANUAL SEARCH FWD (▷▷) key to position the pickup near the center of the disc.
- Insert a hex wrench into the tangential adjustment screw section from the rear of the mechanism.
- Close the tray.

Note: Do not use an L-shaped hex wrench. Use one such as shown to the left. Using an L-shaped hex wrench can cause the tray to come loose (see page 31 5. Grating Adjustment (1)).

Step No.	Oscilloscope Setting		Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
	V	H				
		200ns	TP1 Pin 1 RF output	Tangential adjustment screw	Sharpest possible eye pattern	• Press the TRACK FWD (▷▷I), PLAY (▷), and PAUSE (▯▯) keys sequentially to close the all servos (pause indicator will illuminate). • Observe TP1 pin 1 (RF output) on the oscilloscope and adjust the tangential adjustment screw to achieve the sharpest possible eye pattern. • The point to which the adjusting screw should be set lies about halfway between the points at which the eye pattern becomes most blurred when the screw is rotated clockwise and counterclockwise. When the whole waveform becomes clear, concentrate on sharpening the fine lines forming the diamond at the center of the eye pattern (see Photo 10-8). Adjust until the fine lines on all four sides of the diamond are both sharply defined and dense, as shown in Photo 10-6.

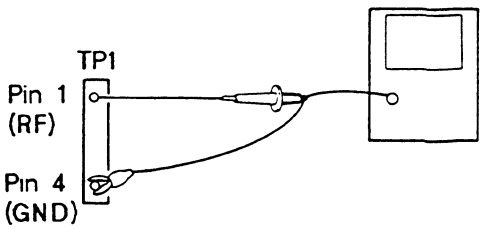
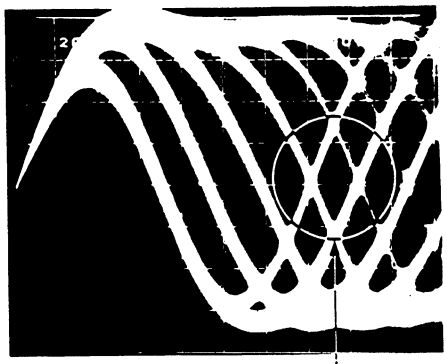
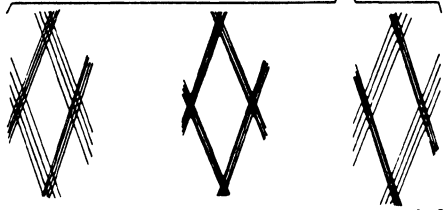


Fig. 10-12

Note: Use a hex wrench to raise the pickup somewhat while making this adjustment.



Part to be observed



Unsatisfactory | Optimum adjustment | Unsatisfactory

Photo 10-6

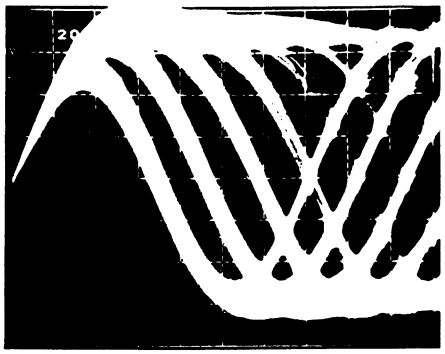


Photo 10-7

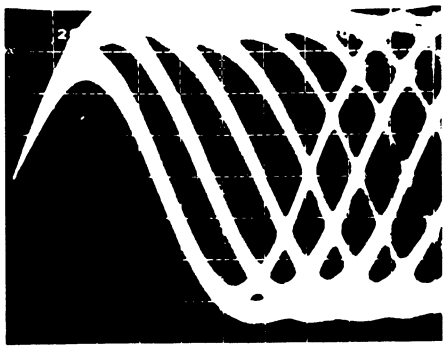


Photo 10-8

Photo 10-9

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
8	Focus gain adjustment					
	20mV / div CH1(X), 5mV / div CH2 (Y) (prove 10 : 1)	X-axis TP1 Pin 5 (FOCS. IN) Y-axis TP1 Pin 6 (FOCS. ERR)	VR3 (FOCS. GAN)	Phase difference of 90°		• With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. 10-13. • Put unit in the test mode (see page 28). • Press the TRACK FWD (▷▷|), PLAY (▷), and PAUSE (▯▯) keys sequentially to close the focus, spindle, and tracking servos. • Turn ON the power to the oscillator and set it to output a 1.2kHz 1Vp-p signal. *Note: Some oscillators discharge a DC voltage when turned on. It is therefore recommended that the oscillator be connected after it has been turned on.* • Adjust VR3 FOCS.GAN (focus gain) so that the Lissajous's figure becomes a horizontal circle (phase difference of 90°).

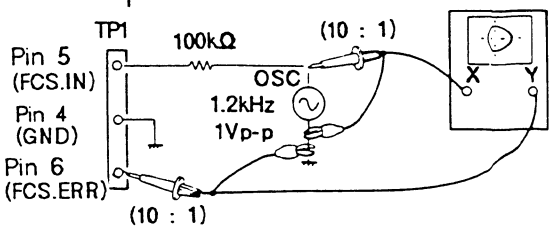
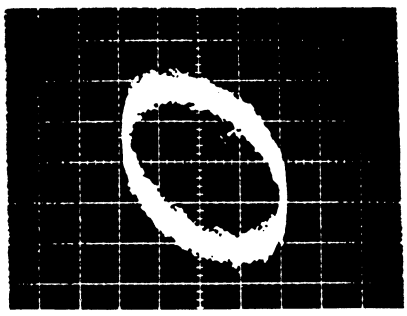
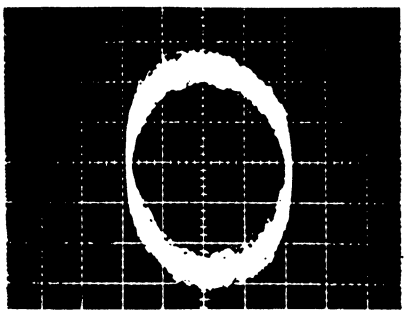


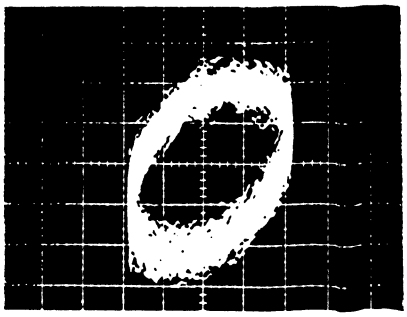
Fig. 10-13



Gain overcompensated
Photo 10-10



Gain optimal
Photo 10-11



Gain undercompensated
Photo 10-12

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
9	Tracking gain adjustment					
	50mV / div CH1 (X), 5mV / div CH2 (Y) (prove 10 : 1)	X-axis TP1 Pin 3 (TRKG. IN) Y-axis TP1 Pin 2 (TRKG. OUT)	VR4 (TRKG.GAN)	Phase difference of 90°		• With the oscillator power turned OFF, connect the oscilloscope and oscillator as shown in Fig. 10-14. • Put unit in the test mode (see page 28). • Press the TRACK FWD (⊳⊳|), PLAY (⊳), and PAUSE (⊓⊓) keys sequentially to close the focus, spindle, and tracking servos. • Turn ON the power to the oscillator and set it to output a 1.2 kHz 2Vp-p signal. *Note: Some oscillators discharge a DC voltage when turned on. It is therefore recommended that the oscillator be connected after it has been turned on.* • Adjust VR4 TRKG.GAN (tracking gain) so that the Lissajous's figure becomes a horizontal circle (phase difference of 90°).

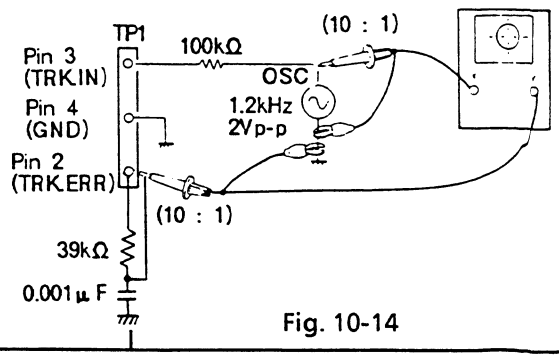
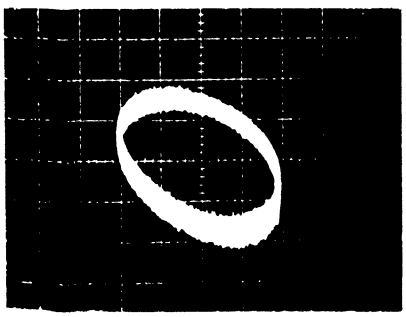
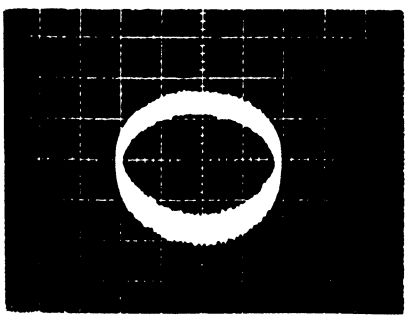


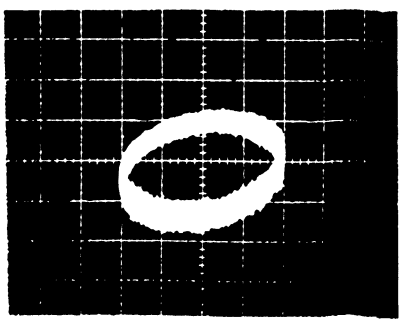
Fig. 10-14



Gain overcompensated
Photo 10-13



Gain optimal
Photo 10-14



Gain undercompensated
Photo 10-15

Step No.	Oscilloscope Setting V	Oscilloscope Setting H	Test Points	Adjusting Points	Check items / Adjustment specifications	Adjustment procedure
10	VCO free-run adjustment					
			TP2 Pin 2	VR8 (VCO.ADJ)	4.375 ± 0.025MHz	• Put unit in the test mode (see page 28). • Short the ASY and GND jumper with a screwdriver or similar tool (see Fig. 10-15). • Connect a frequency counter capable of measuring frequencies of 10MHz and above to TP2 pin 2. • Adjust VR8 (VCO adjust) so that the frequency counter reading becomes 4.375 ± 0.025 MHz.
11	Method for confirming focus error					
			TP1 Pin 6 (FOCS. ERR)			• Put unit in the test node (see page 28). • Ground TP1 pin 5 FOCS. IN (focus in) to GND. • Observe the waveform output by TP1 pin 6 FOCS. ERR (focus error) when the TRACK FWD (▷▷|) key is pressed.

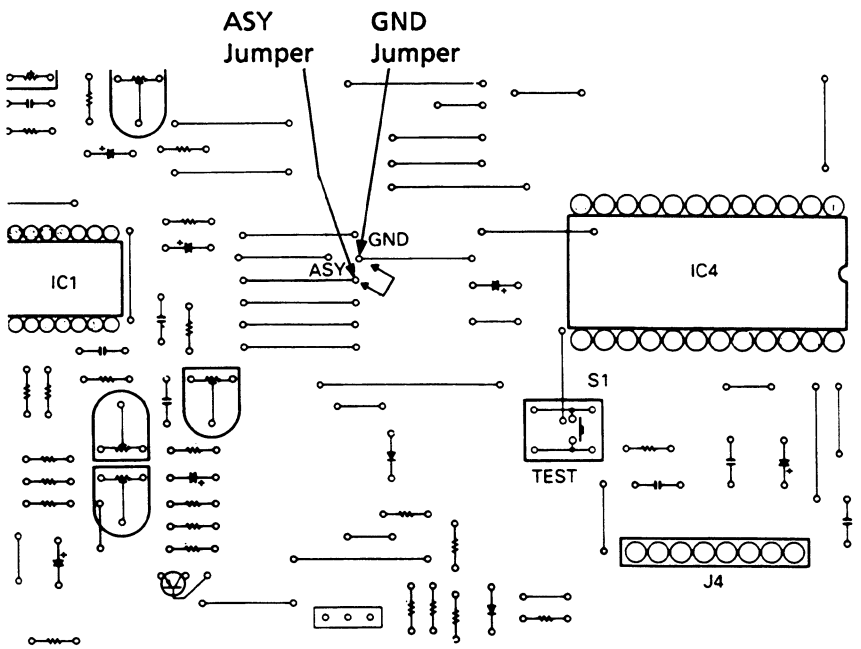


Fig. 10-15 ASY and GND Jumper position

10. RÉGLAGE

On trouvera ci-après les réglages requis pour cet appareil.
Ils doivent être exécutés dans l'ordre donné.

• RÉGLAGES ET ITEMS DE VÉRIFICATION

1. Réglage de compensation, de mise au point et RF.
2. Réglage de niveau RF
3. Vérification d'alimentation de diode laser
4. Vérification de verrouillage de mise au point et de verrouillage d'axe
5. Réglage de grille
6. Réglage d'équilibre d'alignement
7. Réglage tangentiel
8. Réglage de gain de mise au point
9. Réglage de gain d'alignement
10. Réglage de fréquence libre VCO
11. Méthode de confirmation du caractère S

• EQUIPEMENTD NÉCESSAIRES

1. Oscilloscope
2. Wattmètre optique
3. Disque d'essai (YEDS-7)
4. Filtre d'ajustement de gain de boucle
5. Générateur de signal
6. Fréquencemètre
7. Tournevis, pinces, fer à souder, etc.

• A PROPOS DU MODE D'ESSAI

Tous les réglages doivent être effectués, l'appareil se trouvant en mode d'essai.

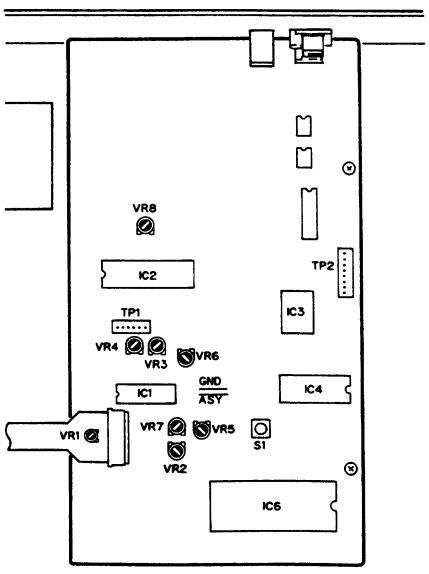
Mise en / hors service du mode d'essai

① Pour actualiser le mode d'essai, allumer (ON) l'interrupteur d'alimentation (S301) après avoir placé l'interrupteur du mode d'essai (S1) à la position ON.
② Le mode d'essai est annulé en ramenant l'interrupteur d'alimentation sur OFF.

Les fonctions des touches en mode d'essai sont décrites au Tableau 10-1.

• DISPOSITIFS D'AJUSTEMENT ET NO MENCLATURE

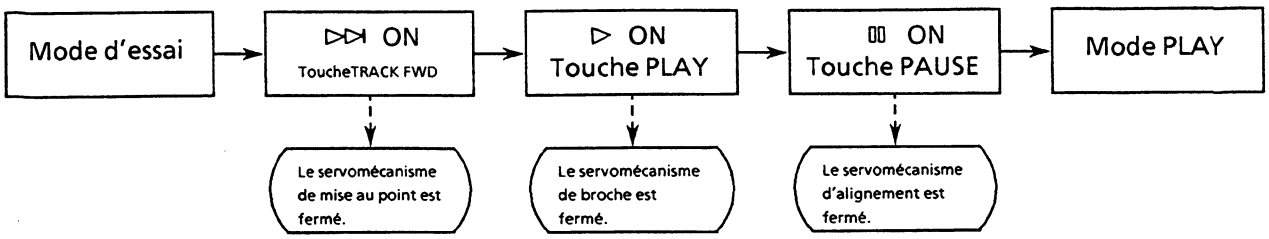
Alimentation laser
VR2: Décalage RF (RF. OFS)
VR3: Gain de mise au point (FOCS. GAN)
VR4: Gain d'alignement (TRKG. GAN)
VR5: Equilibrage d'alignement (TRKG. BAL)
VR6: Décalage de mise au point (TRKG. OFS)
VR7: Décalage d'alignement (VCO. OFS)
VR8: Ajustement VCO (VCO. ADJ)



En mode d'essai, les servos doivent être fermés et ouverts individuellement. En conséquence, les servos doivent chacun être fermés dans la séquence correcte (séquence sérielle) afin de placer l'appareil en mode de lecture. Remarquer également que l'appareil ne se placera pas en mode de lecture par une poussée sur la touche PAUSE (⏸).

Par exemple, pour passer du mode d'arrêt au mode de lecture, les touches de fonction doivent être actionnée dans l'ordre suivant.

* En mode d'essai, les servos doivent être opérés en séquence sérielle.



• FONCTIONS DES TOUCHES EN MODE D'ESSAI

Symbole	Nom de touche	Fonction en mode d'essai	Description
⏭	TRACK FWD	Servo de mise au point fermé	Allume la diode laser et élève ou abaisse l'actuateur de mise au point pour fermer le servo de mise au point.
▷	PLAY	Servo d'axe fermé	Ferme le servo en mode CLV-A après cognement du moteur d'axe.
⏸	PAUSE	Fermture / ouverture de servo d'alignement	Agit comme interrupteur articulé: ferme le servo d'alignement et active le mode de lecture quand poussé (pourvu que les servos de mise au point et d'alignement soient fermés), auquel moment le témoin PAUSE s'allume; ouvre le servo d'alignement à la poussée suivante.
⏮	MANUAL SEARCH REV	Inversion du chariot (déplacement vers l'intérieur)	Déplace rapidement (3 cm / sec) le chariot vers la plage la plus au centre. Prendre garde à ne pas déplacer trop loin car il n'existe pas de dispositif de sécurité pour arrêter le chariot.
⏭	MANUAL SEARCH FWD	Avance du chariot (déplacement vers l'extérieur)	Déplace rapidement (3 cm / sec) le chariot vers la plage la plus à l'extérieur. Prendre garde à ne pas déplacer trop loin car il n'existe pas de dispositif de sécurité pour arrêter le chariot.
⏹	STOP	STOP	Arrête tous les servos et ramène le système à l'état initial.
⏏	OPEN / CLOSE	Ouverture / fermeture du plateau de disque	Ouvre et ferme le plateau du disque. Cependant, le capteur ne revient pas à la position de repos à OPEN et il reste stationnaire à CLOSE.

Tableau 10-1

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
1	**Réglage de compensation, de mise au point et RF.**					
			TP1 Broche 2 (TRKG. ERR)	VR5 (TRKG. BAL) VR7 (TRKG. OFS)	Compensation 45° 0V ± 50mV	• Placer l'appareil en mode d'essai (voir page 42). • Régler VR5 TRKG. BAL (équilibrage d'alignement) à la position environ à 45° à la gauche du centre*. • Régler VR7 TRKG. OFS (décalage d'alignement) de sorte que la tension TRKG. ERR (erreur d'alignement) à TP1 broche 2 devienne 0V ± 50mV.
			TP1 Broche 6 (FOCS. ERR)	VR6 (FOCS. OFS)	Décalage de mise au point 0V ± 50mV	• Régler VR6 FOCS. OFS (décalage de mise au point) de sorte que la tension FOCS. ERR (erreur de mise au point) à TP1 broche 6 devienne 0V ± 50mV
			TP1 Broche 1 (RF. OUTPUT)	VR2 (RF. OFS)	Décalage RF 100mV ± 50mV	• Régler VR2 RF. OFS (décalage RF) de sorte que la tension de sortie RF à TP1 broche 1 devienne 100mV ± 50mV. *Remarque: Lors de l'ajustement de la compensation, effectuer toujours "6": "Réglaer d'équilibrage d'alignement".*
2	**Réglage du niveau RF**					
			TP1 Broche (RF OUT)	VR1 (Laser power)	1,5V + 0.2 V − 0V	• Placer l'appareil en mode d'essai (voir page 42). • Raccorder l'oscilloscope à TP1 broche 1 (sortie RF), reproduire le disque d'essai et mesurer la tension P-P de la forme d'onde RF. • Ajuster VR1 (puissance laser) de façon à ce que la tension soit de 1,5v $^{+0.2\,V}_{-0V}$.

N° d'étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
3	Vérification d'alimentation LD (diode laser)					
					Moins de 0,13mW	• Placer l'appareil en mode d'essai (voir page 42). • Appuyer sur les touches TRACK FWD (▷▷|) pour allumer la diode laser. • Placer le puissance-mètre optique directement sur la lentille et vérifier que la puissance de la diode laser ne dépasse pas 0,12mW.
4	Vérification de verrouillage de mise au point et de verrouillage d'axe					
	V 0,5V / div	H 100ms ec / div	TP1 Broche 1 (sortie RF)		Le signal RF est fourni Rotation avant (sens des aiguilles)	• Installer le disque d'essai. • Placer l'appareil en mode d'essai (voir page 42). • Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur au centre du disque. • Observer la sortie de TP1 broche 1 (sortie RF) sur l'oscilloscope. Confirmer que le signal haute fréquence est fourni après que la touche TRACK FWD (▷▷|) est actionnée. • Appuyer sur la touche PLAY (▷) et confirmer que le disque tourne à vitesse constante (env. 30 tr / mn près du centre du disque) dans le sens avant (sens des aiguilles). Il peut arriver que le disque ne tourne pas ou tourne dans le sens contraire des aiguilles.

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
5	**Réglage de grille (1)**					

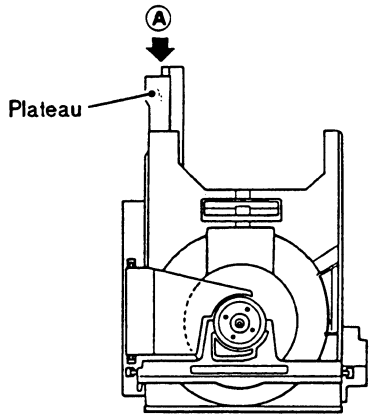


Fig. 10-1

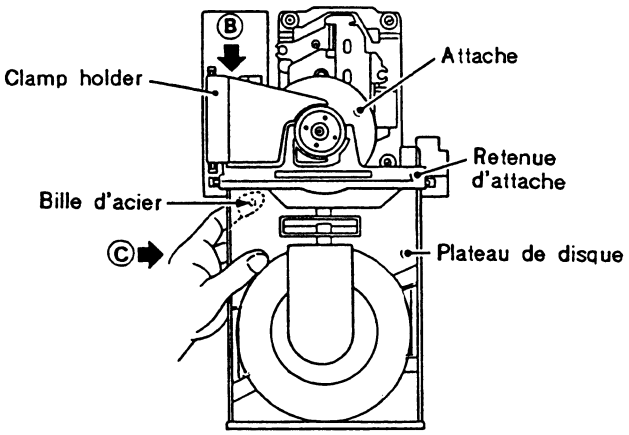


Fig. 10-2

Retirer le disque du plateau avant de commencer cet réglage.

- Retrait du plateau du disque

1. Pousser sur le bord arrière à l'endroit marqué Ⓐ sur la Fig. 10-1, (*1) tout en retirant le plateau du disque vers la position où il tient, comme illustré sur la Fig. 10-2.

(*1) Lorsqu'on appuie à l'arriér de la crémaillère (A), le dispositif de maintien du disque est déverrouillé. Une pression prolongée au-delà de l'ouverture complète éjecte le tiroir du disque.

2. Tout en tirant l'attache Ⓑ (voir Fig. 10-2) vers le haut de la main droite, tenir le plateau comme indiqué par Ⓒ de la main gauche et tirer vers l'extérieur. Prendre garde à ne pas laisser tomber les bills d'acier. Il est conseillé de maintenir la bille en place par l'index gauche tout en extrayant le plateau.

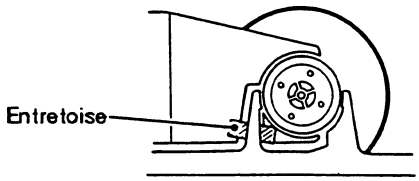


Fig. 10-3

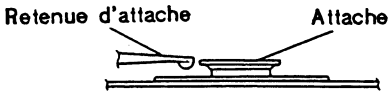


Fig. 10-4

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
						• Placer l'appareil en mode d'essai (voir page 42). • Appuyer sur la touche MANUAL SEACH FWD (▷▷) pour amener le capteur près de l'endroit qui devrait être le centre du disque. Positionner le capteur de sorte de sa vile de réglage de grille soit visible par l'orifice allongé sur le côté du moteur d'axe de la plaque de base sur servomécanisme. • Comme illustré sur la Fig. 10-5, introduire un ⊖ tournevis (moins) par l'arrière du mécanisme de sorte que la vis de réglage de grille puisse être tournée. • Installer le disque d'essai; veiller à insérer une entretoise de 3-5 mm (si aucune entretoise n'est disponible, se servir d'une clé hexagonale) entre l'attache et la retenue d'attache illustré sur la Fig. 10-3. • Confirmer que l'attache et la retenue ne fasse pas contact l'une sur l'autre (Fig. 10-4). • Appuyer sur les touches TRACK FWD (▷▷|) et PLAY (▷) en séquence pour fermer les servos de mise au point et d'axe (ne pas fermer le servo d'alignement). • Installer un filtre passe-bas de coupure à 4 kHz entre l'oscilloscope et TP1 broche 2 (TRKG. ERR) et 4 (GND) comme illustré sur la Fig. 10-6 et observer la forme d'onde de TP1 broche 3 (erreur d'alignement) sur l'oscilloscope. • Tourner la vis d'ajustement de grille à l'aide du tournevis pour trouver le point nul (voir Photo 10-1). • Tourner ensuite lentement la ⊖ tournevis DANS LE SENS CONTRAIRE DES AIGUILLES du point nul et régler au point où la forme d'onde (signal d'erreur d'alignement) arrive à son amplitude maximale (voir Photo 10-3). *Remarque: Eviter d'appuyer sur le tournevis pendant le réglage de la vis, car ceci dépacerait le capteur vers l'intérieur, rendant l'ajustement plus difficile*

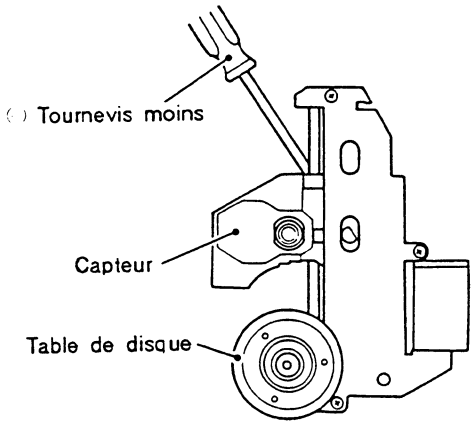


Fig. 10-5

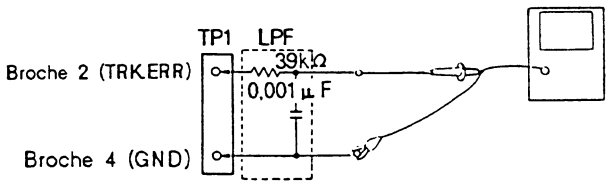


Fig. 10-6

0,5V / div	5ms / div	TP1 Broche 2 (TRKG. ERR)	Vis d'ajustement de grille	Point nul
			Vis d'ajustement de grille	Amplitude maximale

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
						• En dernier lieu, retirer le filtre passe-bas et confirmer que la tension p-p du signal d'erreur d'alignement ne varie par fortement quand le capteur est déplacé à la première et à la dernière plage du disque. Si les niveaux divergent de 10% ou davantage, ré-ajuster le point d'amplitude d'erreur maximale en tournant sur la vis d'ajustement. Remonter le plateau du disque selon la procédure ci-après après avoir terminé l'ajustement de grille. 1. Retirer le disque et l'entretoise. 2. Tout en levant l'attache (marquée par Ⓑ sur la Fig. 10-2) de la main droite, tenir le plateau de la main droite comme illustré par Ⓒ et déplacer la base coulissante dans les armatures en résine dure sur la base de chargement, comme indiqué sur la Fig. 10-7 pour ré-insérer le plateau du disque. A ce moment, prendre soin de tenir la bille d'acier en place par l'index de la main droite. Veiller également que le panneau avant ne soit pas endommagé par le roulement (dans la base coulissante), entrant en contact avec le panneau. 3. Insérer la base coulissante de sorte qu'elle s'engage dans les armatures en résine dure à l'arrière de la base de chargement (voir Fig. 10-8). 4. Insérer à ferme le plateau.

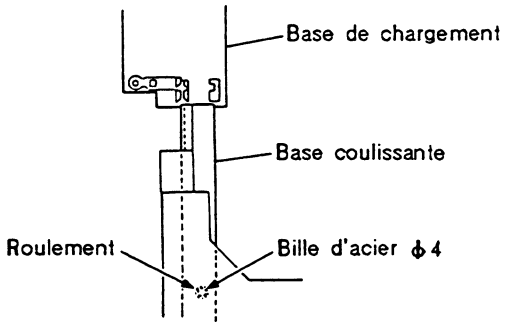


Fig. 10-7

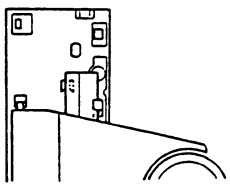


Fig. 10-8

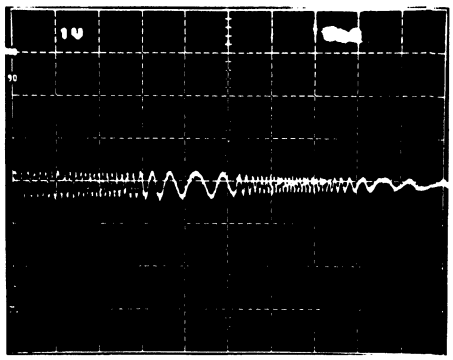


Photo 10-1 Point nul

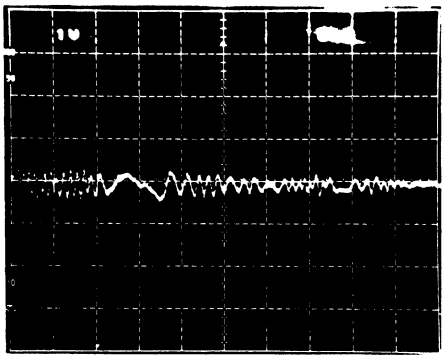


Photo 10-2 Ceci n'est pas la forme d'onde du point nul

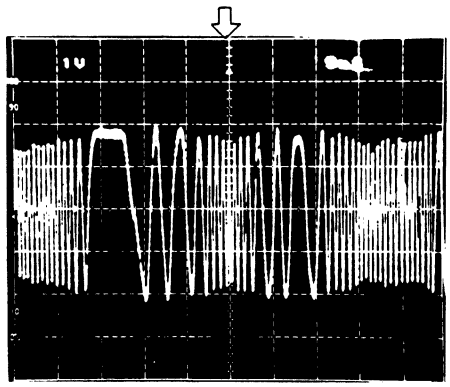


Photo 10-3 Amplitude maximale

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
5	**Réglage de grille (2) (utiliser un disque d'une durée d'enregistrement de 60 min. ou davantage)**					
						Remarque: Cet réglage peut être effectué seule-ment avec un disque ayant des cavités jusqu'à R115mm et non pas avec le disque d'essai YEDS-7. • Régler l'appareil en mode d'essai (voir page 42). • Installer le disque d'essai, amener le capteur à la périphérie extérieure de sorte que l'orifice d'ajustement de grille soit visible de la surface du disque ou par l'orifice du servomécanisme (Voir Fig. 10-9). • Appuyer sur la touche TRACK FWD (⊳⋈) et PLAY (⊳) en séquence pour allumer le servo de mise au point et le servo d'axe (ne pas tourner le servo d'alignement). • Observer la forme d'onde TRKG.ERR (erreur d'alignement) à TP1 broche 2 sur un oscilloscope, en insérant un filtre passebas de 4 kHz (voir Fig. 10-10).
	0,5V/ div	5ms/ div	TP1 Broche 2 (TRKG. ERR)	Grille Grille	Point nul Amplitude maximale	• Insérer un tournevis dans l'orifice de grille, le tourner et rechercher le point nul (voir Photo 10-1). • Tourner ensuite lentement le ⊖ tournevis DANS LE SENS CONTRAIRE DES AIGUILLES à partir du point nul jusqu'à ce que la forme d'onde (signal d'erreur d'alignement) atteigne l'amplitude maximale (voir Photo 10-3). *Remarque: Agir avec précaution car une insertion forcée du tournevis provoquera un flottement du capteur vers l'intérieur.*

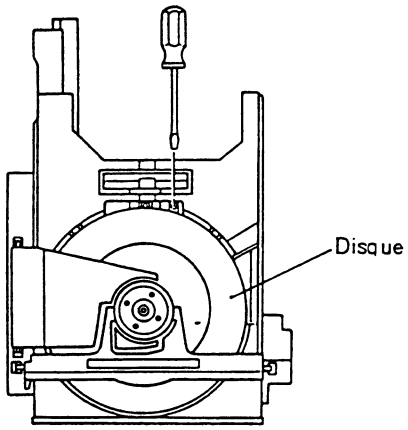


Fig. 10-9

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
						• Finalement, confirmer qu'il n'y a pas de fluctuation importante dans la tension c-c du signal d'erreur d'alignement (ne pas insérer le filtre passe-bas 4 kHz) quand le capteur est déplacé vers la périphérie intérieure et vers la périphérie extérieure. Si l'on constate une différence supérieure à 10% tourner à nouveau la grille et régler le signal d'erreur d'alignement au maximum.
6	**Réglage d'équilibre d'alignement**					
	0,5V/ div	5ms/ div	TP1 Broche 2 (TRKG. ERR)	VR5 (TRKG.BAL)		• Installer le disque d'essai. • Régler l'appareil en mode d'essai (voir page 42). • Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur prés du centre du disque. • Appuyer sur les touches TRACK FWD (▷▷|) et PLAY (▷) en séquence pour faire tourner le disque. • Observer TP1 broche 2 TRKG.ERR (erreur d'alignement) sur l'oscilloscope et régler VR5 TRKG.BAL (équilibrage d'alignement) pour éliminer les éléments DC du signal d'erreur d'alignement.

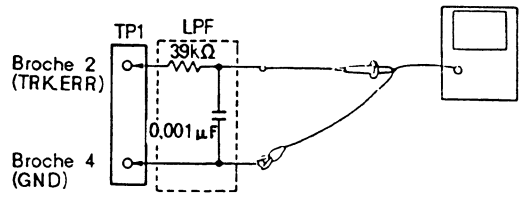
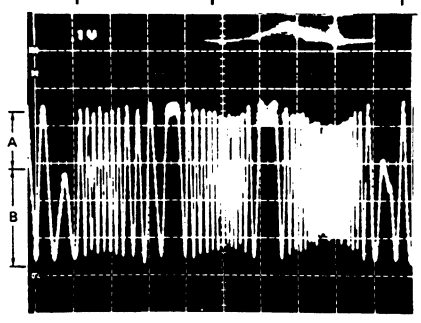


Fig. 10-10



A≠B ➡

Photo 10-4 Eléments DC mêlés au signal

A=B

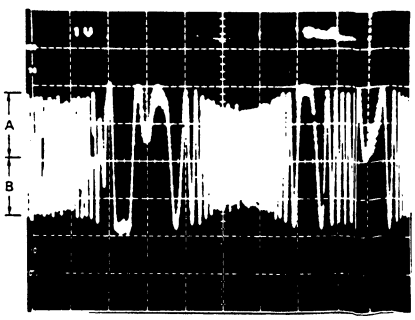
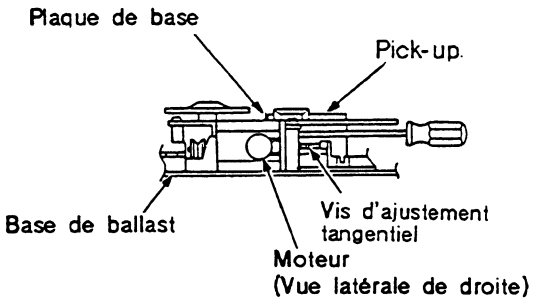
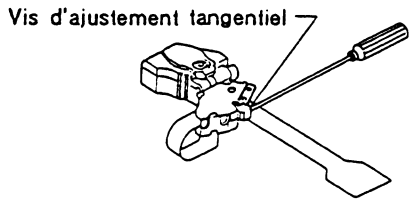


Photo 10-5 Eléments DC éliminés

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
7	**Réglage tangentiel**					
	  Fig. 10-11					• Régler l'appareil au mode d'essai (voir page 42). • Ouvrir le plateau et installer le disque d'essai. • Appuyer sur la touche MANUAL SEARCH FWD (▷▷) pour amener le capteur vers le centre du disque. • Insérer une clé hexagonale par l'orifice de la vis d'ajustement tangentiel par l'arriére du mécanisme. • Refermer le plateau. *Remarque: Ne pas se servir d'une clé hexagonale en L, mais une comme illustré sur la gauche. L'emploi d'une clé hexagonale en L pourrait relâcher le plateau [voir page 46 5. Réglage de grille (1).]*
	200ns		TP1 Broche 1 Sortie RF	Vis d'ajustement tangentiel	Mire la plus nette possible	• Appuyer sur les touches TRACK FWD (▷▷|) et PLAY (▷) en séquence pour fermer les servos (le témoin PAUSE s'allume). • Observer TP1 broche 1 (sortie RF) sur l'oscilloscope et agir sur la vis d'ajustement tangentiel pour obtenir la mire la plus nette possible. • Le point où la vis d'ajustement doit être amenée se trouve environ à mi-course entre les points où la mire est la plus floue quand la vis est tournée à fond dans le sens des aiguilles et dans le sens contraire. Quand toute la forme d'onde devient claire, se concentrer sur la netteté des lignes fines, formant un losange au centre de la mire (voir Photo 10-8). Régler jusqu'à ce que les lignes fines sur les quatre côtés du losange soient bien définies et denses, comme illustré sur la Photo 10-6.

N° d' étape	Réglage d'oscilloscope		Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
	V	H				

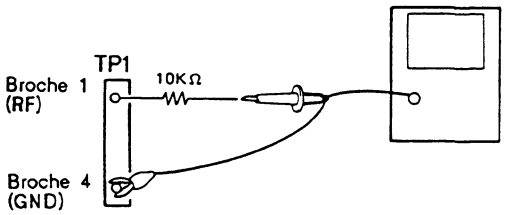
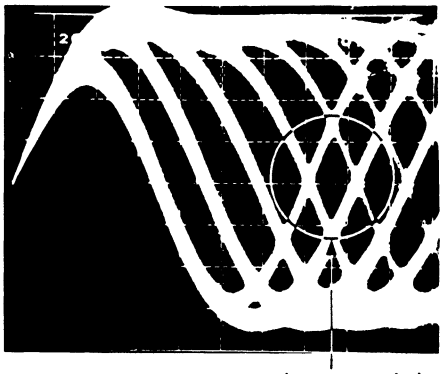
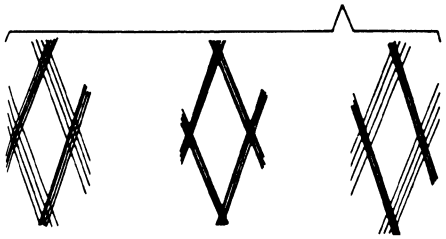


Fig. 10-12

Remarque: Se servir d'une clé hexagonale pour lever légèrement le capteur pendant cet ajustement.



Concentrer sur la netteté du losange



Insatisfaisant | Ajustement optimal | Insatisfaisant

Photo 10-6

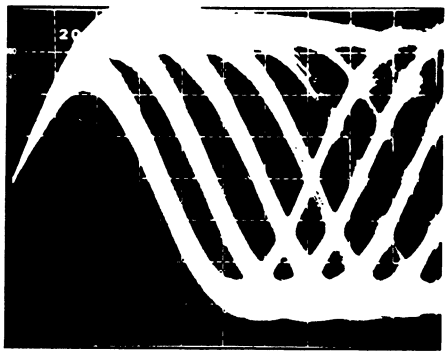


Photo 10-7

Photo 10-8

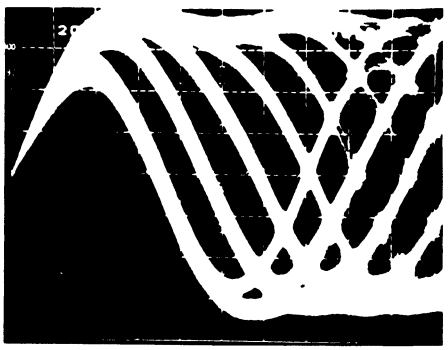


Photo 10-9

N° d'étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
8	Réglage de gain de mise au point					
	20mV/div CH1(X), 5mV/div CH2(Y) (sonde 10:1)	Axe des X TP1 Broche 5 (FOCS. IN) Axe des Y TP1 Broche 6 (FOCS. ERR)	VR3 (FOCS.GAN)	Différence de phase de 90°		• L'alimentation de l'oscillateur étant coupée (OFF), raccorder l'oscillateur comme illustré sur la Fig. 10-13. • Régler l'appareil en mode d'essai (voir page 42). • Appuyer sur les touches TRACK FWD (⊳⊳I), PLAY (▷) et PAUSE (▯▯) en séquence pour actualiser les servos de mise au point, axe et alignement. • Mettre l'oscillateur sous tension (ON) et le régler pour fournir un signal de 1,2kHz 1Vp-p. *Remarque: Certains oscillateurs déchargent une tension DC lors de leur mise sous tension. Par conséquent, il est conseillé de connecter l'oscillateur aprés l'avoir mis sous tension.* • Ajust VR3 FOCS.GAN (gain de mise au point) de sorte que la figure de Lissajou devienne un cercle horizontal (différence de phase de 90°).

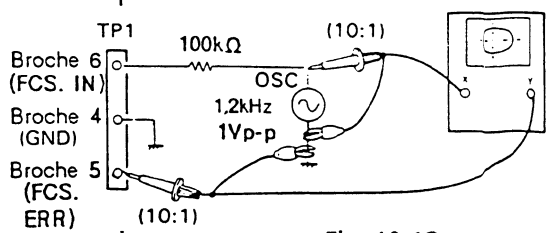
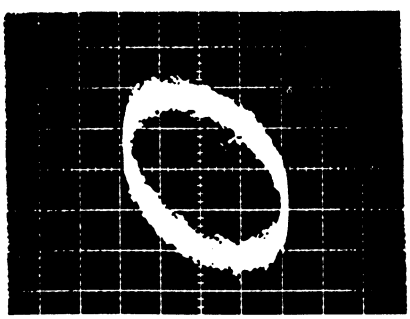
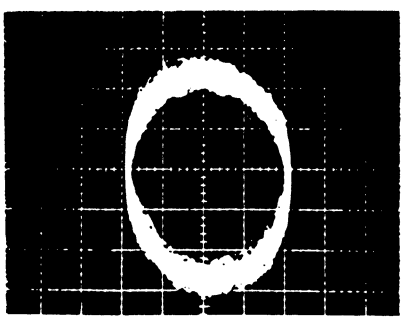


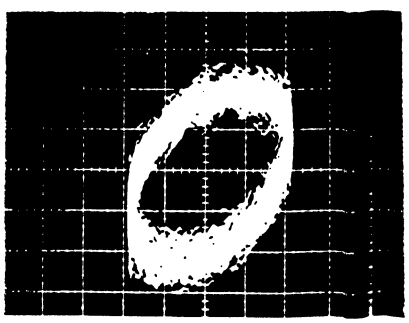
Fig. 10-13



Gain sur-compensé
Photo 10-10



Gain optimal
Photo 10-11



Gain sous-compensé
Photo 10-12

N° d' étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
9	**Réglage de gain d'alignement**					
						• L'alimentation de l'oscillateur étant coupée (OFF), raccorder l'oscillateur comme illustré sur la Fig. 10-14. • Régler l'appareil en mode d'essai (voir page 42). • Appuyer sur les touches TRACK FWD (▷▷|), PLAY (▷) et PAUSE (▯▯) en séquence pour actualiser les servos de mise au point, axe et alignement. • Mettre l'oscillateur sous tension (ON) et le régler pour fournir un signal de 1,2kHz 2Vp-p. *Remarque: Certains oscillateurs déchargent une tension DC lors de leur mise sous tension. Par conséquent, il est conseillé de connecter l'oscillateur après l'avoir mis sous tension.*
	50mV/div CH1(X), 5mV/div CH2(Y) (Sonde 10:1)	Axe des X TP1 Broche 3 (TRKG. IN) Axe DES Y TP1 Broche 2 (TRKG. OUT)	VR3 (FOCS.GAN)		Différence de phase de 90°	• Ajuster VR4 TRKG.GAN (gain d'alignement) de sorte que la figure de Lissajou devienne un cercle horizontal (différence de phase de 90°).

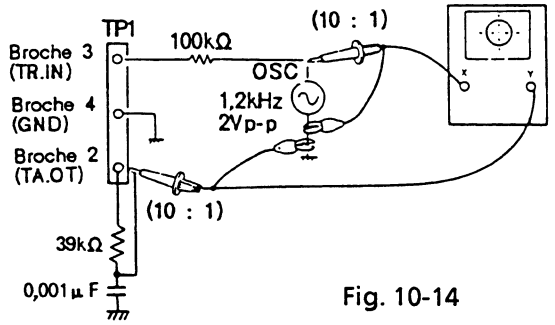
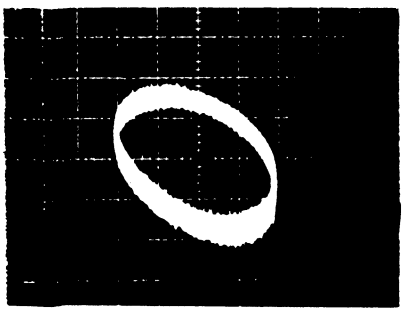
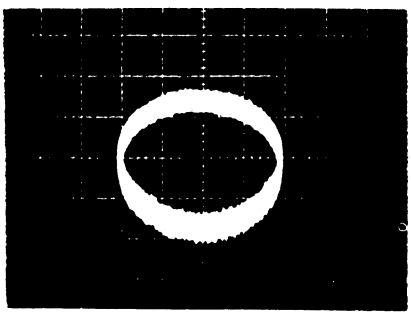


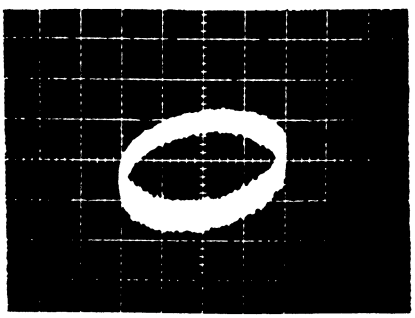
Fig. 10-14



Gain sur-compensé
Photo 10-13



Gain optimal
Photo 10-14



Gain sous-compensé
Photo 10-15

N° d'étape	Réglage d'oscilloscope V	Réglage d'oscilloscope H	Points d'essai	Points de réglage	Postes de contrôle / Spécifications de réglage	Procédure de réglage
10	**Réglage de fréquence libre VC0**					
			TP2 Broche 2	VR8 (VCO.ADJ)	4,375 ± 0,025MHz	• Régler l'appareil en mode d'essai (voir page 42). • Court-circuiter l'ensemble et le cavalier de masse (GND) à l'aide d'un tournevis ou d'un outil analogue (voir Fig. 10-15). • Raccorder un fréquencemètre, capable de mesurer des fréquences de 10MHz et au-delà, sur TP2 broche 2. • Ajuster VR8 (ajustement VCO) de sorte que la lecture du fréquencemètre devienne 4,375 ± 0,025MHz.
11	**Méthode de confirmation d'erreur de mise au point**					
			TP1 Broche 6 (FOCS. ERR)			• Régler l'appareil en mode d'essai (voir page 42). Mettre TP1 broche 5 FOCS.IN (gain de mise au point) à la masse (GND). • Observer la sortie de forme d'onde à TP1 broche 6 FOCS.ERR (erreur de mise au point) quand la TRACK FWD (▷▷I) est actionnée.

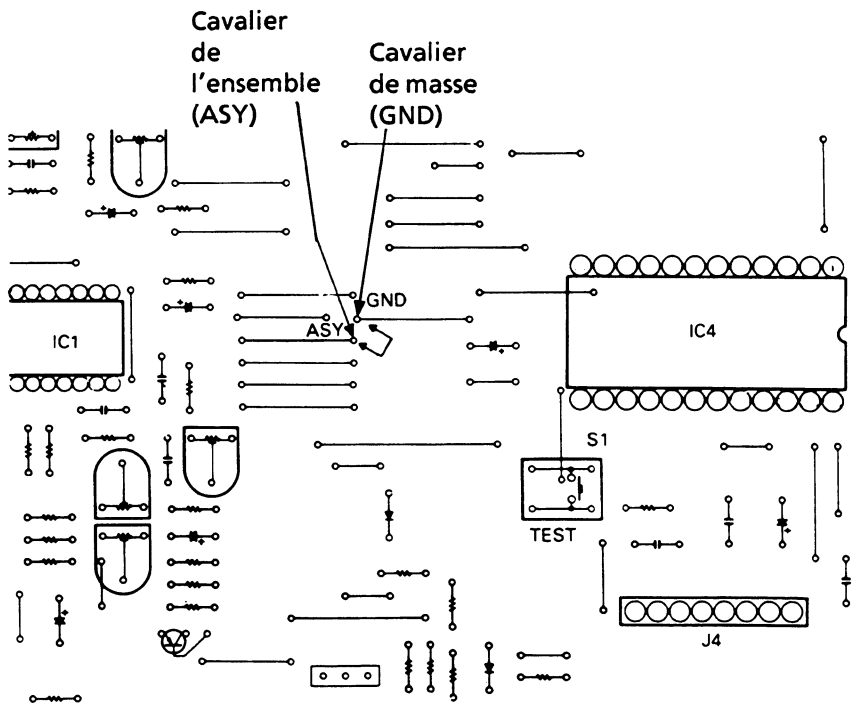


Fig. 10-15 Position des cavaliers des ASY et GND

10. AJUSTE

A continuación se of recen los ajustes para esta unidad. Estos ajustes deberán realizarse en el orden indicado.

• AJUSTES E ITEMES DE COMPROBACIÓN

1. Ajuste de la desviación de seguimiento, foco, y RF
2. Ajuste del nivel de RF
3. Comprobación de la energía del diodo lasér (LD)
4. Comprobación de la sincronización del foco y del eje
5. Ajuste de retícula
6. Ajuste del equilibrio de seguimiento
7. Ajuste tangencial
8. Ajuste de la ganancia de enfoque
9. Ajuste de la ganancia de seguimiento
10. Ajuste de la frecuencia de oscilación libre del oscilador controlade por tensión (VCO)
11. Método para confirmar el carácter S

• EQUIPOS REQUERIDOS

1. Osciloscopio de doble traza
2. Medidor de enería óptica
3. Disco de prueba (YEDS-7)
4. Filtro de ajuste de ganancia de bucle
5. Generador de seùales
6. Frecuencímetro
7. Otros equipos de medición regulares

• Modo de prueba

Todos los ajustes deberán efectuarse con la unidad en el mode de prueba.

Activación y desactivación del mode de prueba

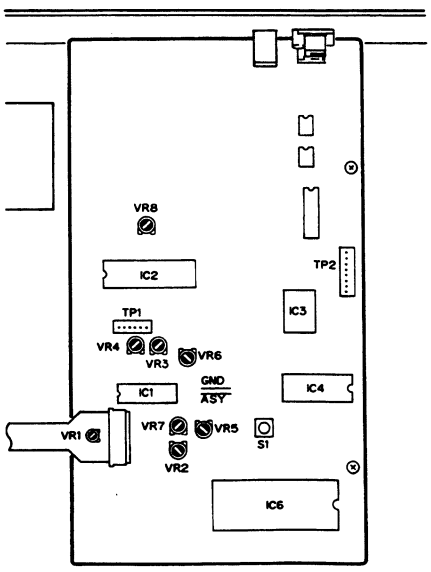
① Para activar el mode de prueba, ponga en ON el interruptor de alimentación (S301) con el interruptor de modo de prueba (S1) en ON.
② El modo de prueba se desactivará poniendo el interruptor de alimentación en OFF.

Las funciones de las teclas en el modo de prueba se describen en la tabla 10-1.

• TORES VARIABLES (VR) DE AJUSTE Y SUS NOMBRES

Energía lasérica

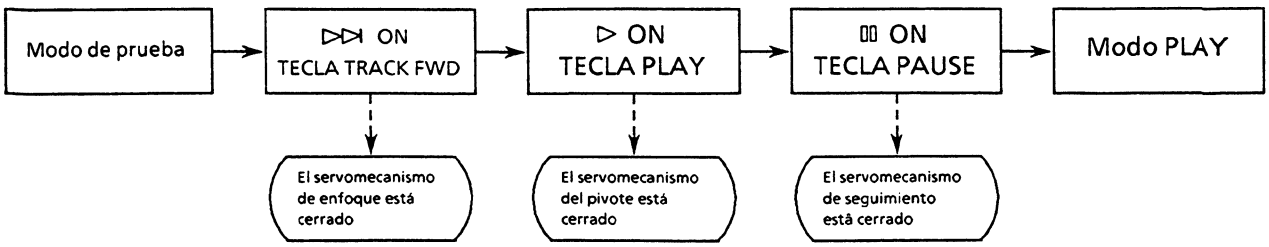
VR2: Desviación de RF (RF.OFS)
VR3: Ganancia de enfoque (FOCS.GAN)
VR4: Ganancia de seguimiento (TRKG.GAN)
VR5: Equilibrio de seguimiento (TRKG.BAL)
VR6: Desviación de enfoque (FOCS.OFS)
VR7: Desviación de seguimiento (TRKG.OFS)
VR8: Ajuste del VCO (VCO.ADJ)



En el modo de prueba, los servos deberán abrir y cerrarse individualmente. Por consiguiente, los servos deberán cerrarse en la secuencia apropiada (secuencia en serie) a fin de poner la máquina en el modo de reproducción. Tenga en cuenta además que la máquina no entrará en el modo de reproducción cuando haya presionado la tecla PAUSE (⏸).

Por ejemplo, para cambiar del modo de parada al de reproducción, tendrá que presionar las teclas de función en el orden siguiente:

* En el modo de prueba, los servos deberán operarse en secuencia en serie.

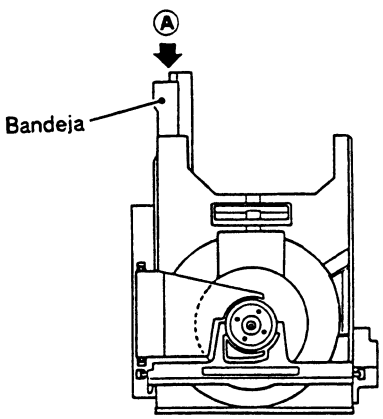


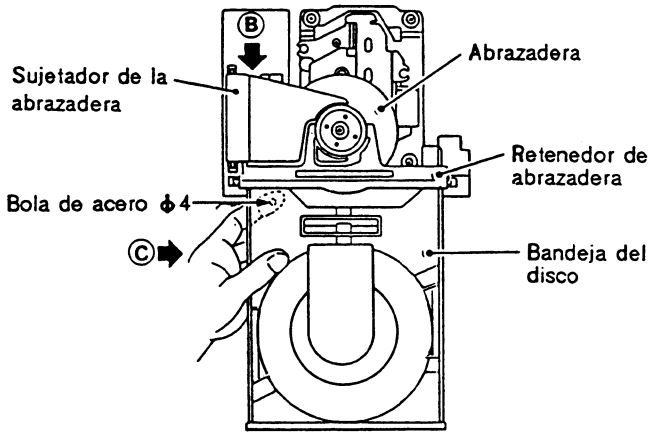
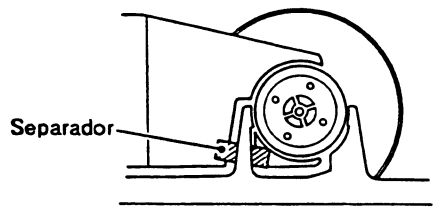
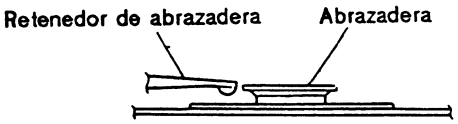
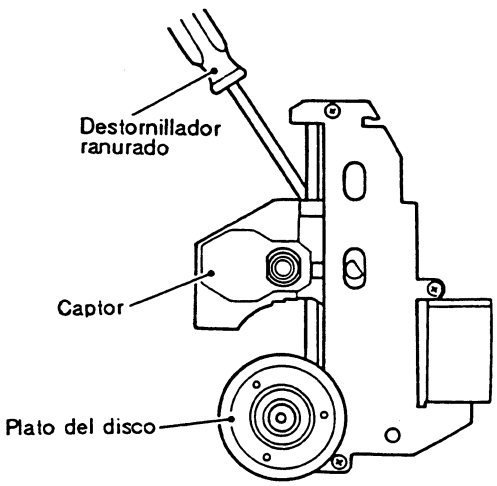
FUNCIONES DE LAS TECLAS EN EL MODE DE PRUEBA

Símbolo	Nombre de la tecla	Función en el modo de prueba	Descripción
⏭	TRACK FWD	Cierre del servo de enfoque	Activa el diodo lasér, y eleva y hace descender el actuador de enfoque para cerrar el servo de enfoque.
▷	PLAY	Cierre del servo del eje	Cierra el servo en el modo CLV-A después de impulsar el motor del eje.
⏸	PAUSE	Cierre/apertura del servo de seguimiento	Actúa como conmutador: cierra el servo de seguimiento y activa el modo de reproducción cuando se presiona (suponiendo que los servos de enfoque y del eje estén cerrados), momento en el que se encenderá el indicador PAUSE; y abre el servo de seguimiento cuando vuelve a presionarse.
⏪	MANUAL SEARCH REV	Retroceso del carro (se mueve hacia adentro)	Mueve el carro rápidamente (3 cm/s) hacia la pista más interior. Tenga cuidado para no moverlo demasiado ya que no hay dispositivo de seguridad para detener el carro.
⏩	MANUAL SEARCH FWD	Avance del carro (mueve el carro hacia afuera)	Mueve el carro rápidamente (3 cm/s) hacia la pista más exterior. Tenga cuidado para no moverlo demasiado ya que no hay dispositivo de seguridad para detener el carro.
□	STOP	Parada	Para todos los servos y devuelve el sistema a su estado inicial.
⏏	OPEN/CLOSE	Apertura/cierre de la bandeja del disco	Abre y cierra la bandeja del disco. Sin embargo, el captor no regresa a su soporte en OPEN (apertura), y permanece estacionario en CLOSE (cierre).

Tabla 10-1.

N• de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
1	**Ajuste de la desviación de seguimiento, foco y RF**					
			TP1 Patilla 2 (TRKG. ERR)	VR5 (TRKG. BAL)	Desviación de seguimiento 45é	• Ponga la unidad en el modo de prueba (consulte la página 58). • Ponga VR5 TRKG.BAL (equilibrio de seguimiento) en una posición aproximadamente 45é a la izquierda del centro*.
				VR7 (TRKG. OFS)	0V ± 50mV	• Ajuste VR7 TRKG.OFS (desviación de seguimiento) de forma que la TRKG.ERR (tensión de error) de seguimiento de la patilla 2 de TP1 sea de 0V ± 50mV.
			TP1 Patilla 6 (FOCS. ERR)	VR6 (FOCS. OFS)	Desviaciôn de enfoque 0V ± 50mV	• Ajuste VR6 FOCS.OFS (desviación de enfoque) de forma que la tensión de FOCS.ERR (error de enfoque) en pa patilla 6 de TP1 sea de 100mV ± 50mV.
			TP1 Patilla 1 (RF OUTPUT)	VR2 (RF. OFS)	Desviación de RF 100mV ± 50mV	• Ajuste VR2 RF.OFS (desviación de RF) de forma que la tensión de salida de RF de la patilla 1 de TP1 sea de 100mV ± 50mV. *Nota: Cuando ajuste la desviación de seguimiento, realice siempre "6. Ajuste del equilibrio de segui-miento".*
2	**Ajuste del nivel de RF**					
			TP1 Patilla1 (RF OUTPUT)	VR1 (Laser power)	1,5 $^{+0.2\,V}_{-0V}$	• Ponga la unidad en el modo de prueba (consulte la página 58). • Conecte el osciloscopio a la patilla 1 de TP1 (salida de RF), ponga en reproducción el disco de prueba, y mida la tensión de pico a pico de la forma de onda de RF. • Ajuste VR1 (alimentación de láser) de forma que la tensión sea 1,5v $^{+0.2\,V}_{-0V}$.

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
3	**Comprobación de la energía del diodo lasér (LD)**					
					Especificación: 0,13mW ± 0,01mW	• Ponga la unidad en el modo de prueba (consulte la página 58). • Presione la tecla TRACK FWD (▷▷I) para activar el diodo lasér. • Coloque el modidor de potencia óptico directamente encima del objetivo y confirme que la potencia LD no exceda 0,13mW.
4	**Comprobación de la sincronización del foco y del eje**					
	0,5V/ div	H 100ms ec/ div	Patilla 1 de TP1 (salida de RF)		La seùal de RF sale Giro en sentido de avance (hacia la derecha)	• Instale el disco de prueba. • Ponga la unidad en el modo de prueba (consulte la página 58). • Presione la tecla MANUAL SEARCH FWD (▷▷) para mover el captor hasta el centro del disco. • Observe la salida de la patilla 1 de TP1 (salida de RF) en el osciloscopio. Compruebe si la seùal de RF sale después de presionar la tecla TRACK FWD (▷▷I). • Presione la tecla PLAY (▷) y compruebe si el disco gira a velocidad constante (aprox. 30 rpm cerca del centro del disco) en sentido de avance (hacia la derecha); el disco puede no girar o hacerlo hacia la izquierda.
5	**Ajuste de retícula (1)**					
	 Fig. 10-1					Antes de inciar este ajuste, extraiga la bandeja del disco. • Extracción de la bandeja del disco. 1. Presione el borde posterior del bastidor, marcado con Ⓐ en la Fig. 10-1, (*1) tirando de la bandeja del disco hasta la posición en la que agarre, mostrada en la Fig. 10-2. (*1) Si presiona el borde posterior del bastidor (A), se libera la abrazdera de discos. Si continua presionando después de que se haya liberado completamenta la abrazadera, sale eyectada la bandeja de discos.

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
	 Fig. 10-2					2. Tirando del soporte de abrazadera Ⓑ (consulte la Fig. 10-2) hacia arriba con la mano derecha, suje te la bandeja como se indica en Ⓒ con la mano izquierda y tire de ella hacia afuera. Tenga cuidado para que no caiga la bola de acero ϕ4 (recomendamos sujetar la bola en su lugar con el dedo indice de la mano izquierda al sacar la bandeja).
	 Fig. 10-3					
	 Fig. 10-4					
	 Fig. 10-5					• Ponga la unidad en el modo de prueba (consulte la página 58). • Presione la tecla MANUAL SEARCH FWD (▷▷) para mover el captor hasta cerca de lo que sería el centro del disco. Coloque el captor de forma que su tornillo de ajuste de reticula se vea a través del orificio alargado situado al lado del motor del eje de la placa base del mecanismo deservos. • Como se muestra en la Fig. 10-5, inserte un ⊖ destornillador (ranurado) desde la parte posterior del mecanismo y compruebe si puede girar el tornillo de ajuste de reticula.

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
						• Instale el disco de prueba; aseúrese de insertar un separador de 3-5 mm (si no dispone de separador emplee una llave hexagonal) entre el sujetador de abrazadera y el retenedor de abrazadera, como se muestra en la Fig. 10-3. • Confirme que la abrazadera y el retenedor de la misma no estén en contacto entre si (Fig. 10-4). • Presione secuencialmente las teclas TRACK FWD (▷▷|) y PLAY (▷) para cerrar los servos de enfoque y del eje (no cierre el servo de seguimiento). • Inserte un filtro de paso bajo de 4kHz de corte entre el osciloscopio y la patilla 3 (TRKG.ERR) y 5 (GND) de TP1, como se muestra en la Fig. 10-6, y observe la forma de onda de la patilla 3 de TP1 (error de seguimiento) en el osciloscopio. • Gire el tornillo de sjuste de retlcula con el destornillador hasta encontrar el punto nulo (consulte la foto 10-1). • A continuación, gire lentamente el ⊖ destormillador HACIA LA IZQUIERDA de punto null y ajùstelo hasta el punto en el que la forma de onda (seùal de error de seguimiento) llegue por primera vez a su máxima amplitud (consulte la foto 10-3). *Nota: Evite aplicar excesiva presión al destornillador cuando ajuste el tornillo. De lo contrario, el captor se moverá hacia adentro haciendo más dificil el ajuste.* • Por último, desconecte el filtro de paso bajo y confirme que la tensión de pico a pico de la seùal de error de seguimiento no varie mucho cuando el captor se mueva de la pista más interior a la más exterior del disco. Si los niveles diferen en un 10% o más, reajuste el punto de error de amplitud máxima girando el tornillo de ajuste de reticula.
	0,5V/ div	5ms/ div	TP1 Patilla 2 (TRKG. ERR)	Tornillo de ajuste de reticula Tornillo de ajuste de reticula	Punto nulo Amplitud máxima	

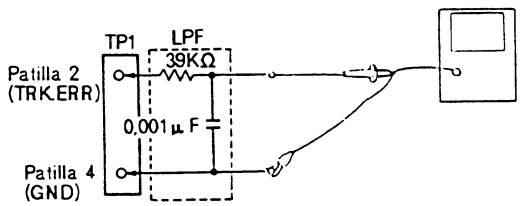


Fig. 10-6

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
						Una vez finalizado el ajuste de reticula, vuelva a montar la bandeja del disco de acuerdo con el procedimiento siguiente. 1. Extraiga el disco y el separador. 2. Levantando el sujetador de abrazadera (marcado con Ⓑ en la Fig. 10-2) con la mano izquierda, sujete la bandeja con la mano izquierda como se indica en Ⓒ y deslica la base deslizable en los acopladores de resina rigida de la base de carga como se muestra en la Fig. 10-7 para reinsertar la bandeja del disco. En este momento, asegûrese de sujetar la bola de acero en su lugar con el dedo indice de la mano izquierda. Además, tenga cuidado para no dañar el panel frontal con la base deslizable y el cojinete de boals de acero (de la base deslizable). 3. Inserte la base deslizable de forma que encaje en los dos acopladores de resina rigida de la parte posterior de la base de carga (consulte la Fig. 10-8). 4. Inserte completamente la bandeja del disco.

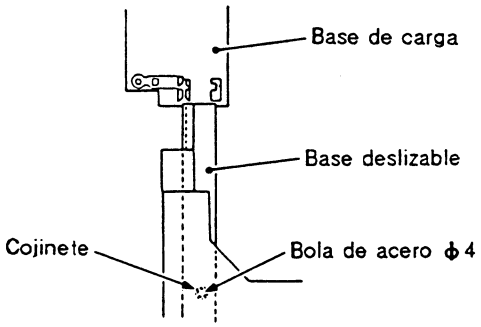


Fig. 10-7

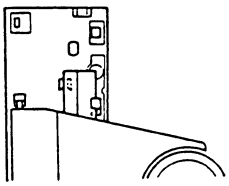


Fig. 10-8

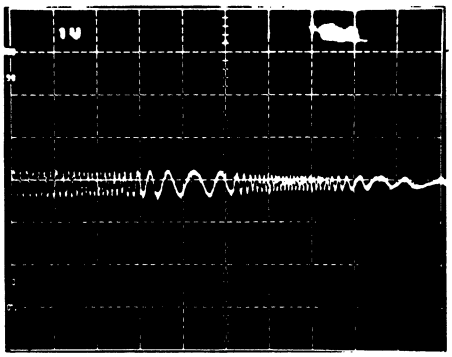


Foto 10-1

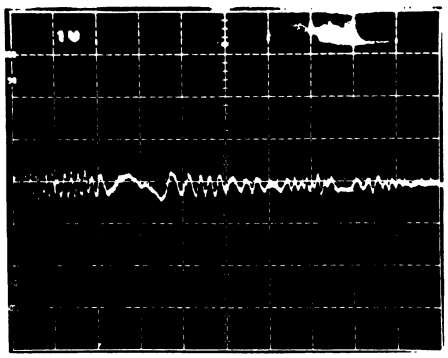


Foto 10-2

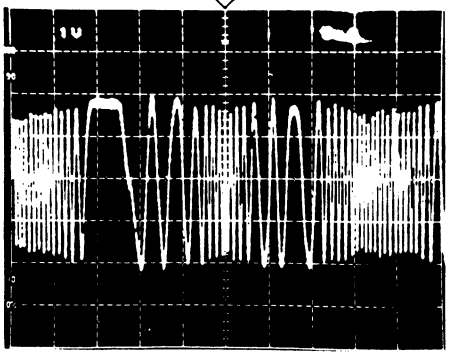


Foto 10-3

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
5	Ajuste de retîcula (2) (empleando discos con una duración de reproducción de 60 min o más)					
						Nota: Este ajuste podrá realizarse solamente con un disco que tenga hoyos de hasta R115mm, en este caso utilizaremos el disco de prueba (YEDS-7).
						• Ponga la unidad en el modo de prueba (consulte la página 58).
						• Instale el disco de prueba, desplace el captor hasta la pista exterior de forma que el orificio de ajuste de reticula del captor quede visible desde la superficie de hoyos del disco o a través del orificio del mecanismo de servos (consulte la Fig. 10-9).
						• Presione secuencialmente las teclas TRACK FWD (▷▷|) y PLAY (▷) para cerrar los servos de enfoque y del eje (no cierre el servo de seguimiento).
						• Observe la forma de onda de TRKG.ERR (error de seguimiento) de la patilla 2 de TP1 en el osciloscopio, insertando un filtro de paso bajo de 4 kHz (consulte la Fig. 10-10).
	0,5V/ div	5ms/ div	TP1 Patilla 2 TRKG. ERR	Reticula	Punto nulo	• Inserte un destornillador en el orificio del tornillo de ajuste de reticula, gire y halle el punto nulo (consulte la foto 10-1).
				Reticula	Amplitud máxima	• A continuación, gire lentamente Θ destornillador HACIA LA IZQUIERDA desde el punto nulo hasta que la forma de onda (seùal de error de seguimiento) alcance la máxima amplitud (consulte la foto 10-3).
						Nota: Tenga cuidado, porque si inserta el destornillador a la fuerza, la unidad captora se elevará.
						• Por último, confirme que no haya gran fluctuación la tensión de pico a pico de la seùal de error de seguimiento (no inserte el filtro de paso bajo de 4kHz de corte) cuando el captor se desplace de la pista más interior a la más exterior del disco. Si la diferencia es mayor del 10% o más, vuelva a girar el tornillo de ajuste de reticula y ajuste la señal de error al máximo.

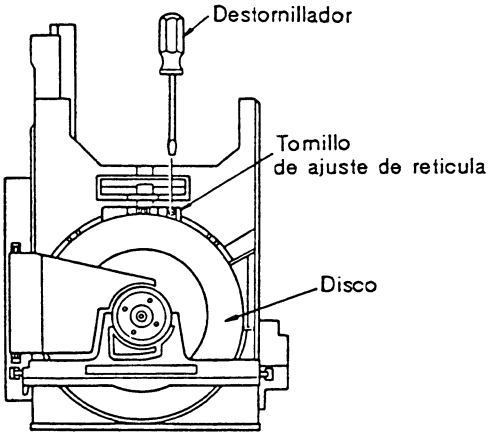


Fig. 10-9

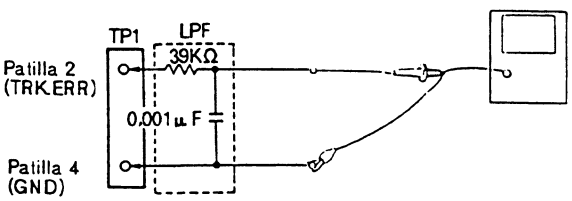
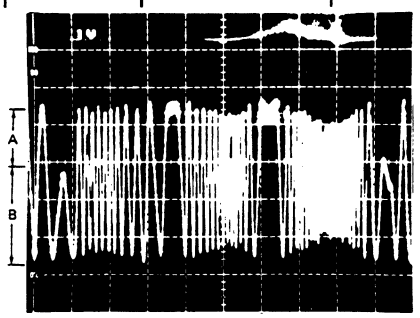


Fig. 10-10

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
6	**Ajuste del equilibrio de seguimiento**					
	0,5/div	5ms/ div	TP1 Patilla 2 (TRKG. ERR)	VR5 (TRKG.BAL)		• Instale el disco de prueba. • Ponga la unidad en el modo de prueba (consulte la página 58). • Presione la tecla MANUAL SEARCH FWD (▷▷) para colocar el captor cerca del centro del disco. • Presione secuencialmente las teclas TRACK FWD (▷▷|) y PLAY (▷) para hacer que el disco gire. • Observe la forma de onda (error de seguimiento) de la patilla 2 (TRKG.ERR) de TP1 en el osciloscopio, y ajuste VR5 TRKG.BAL (equilibrio de seguimiento) para eliminar los elementos de CC de la seùal de error de seguimiento.



A≠B

Foto 10-4. Elementos de CC mezclados con la

A = B

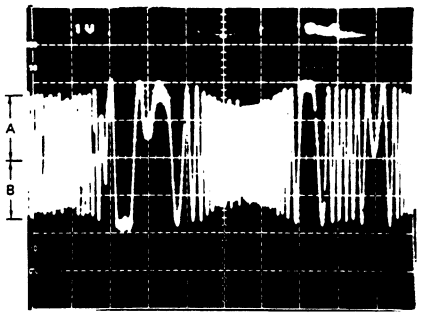
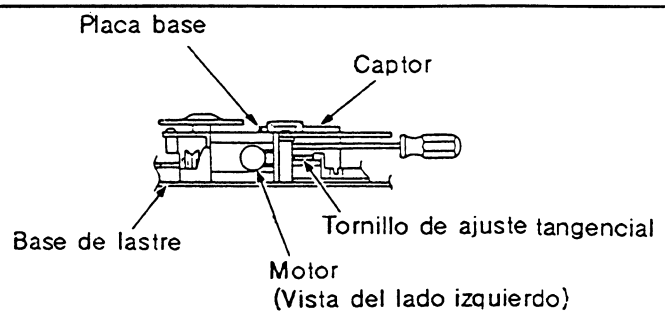
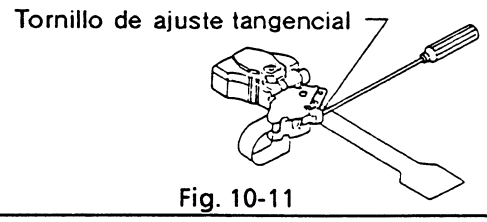
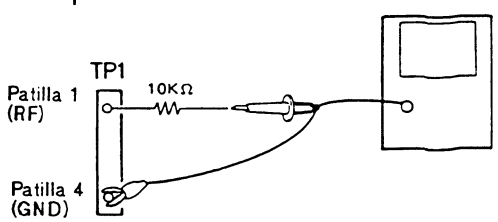
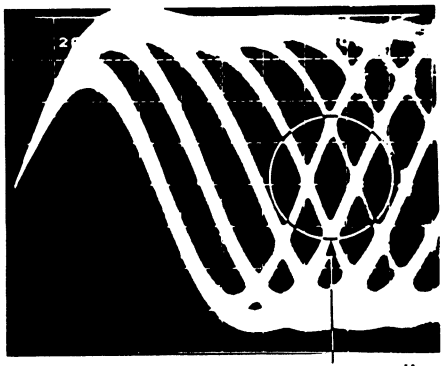


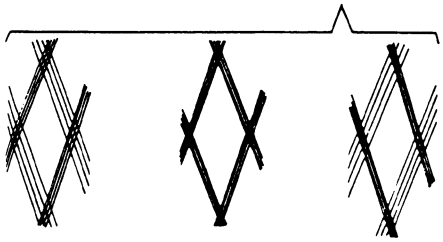
Foto 10-5. Elementos de CC eliminados

7	**Ajuste tangencial**	
	  Fig. 10-11	• Ponga la unidad en el modo de prueba (consulte la página 58). • Presione la tecla MANUAL SEARCH FWD(▷▷) para colocar el captor cerca del centro del disco. • Inserte una llave hexagonal en la sección del tornillo de ajuste tangencial desde la parte posterior del mecanismo. • Cierre la bandeja

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
		200ns	TP1 Patilla 1 Salida de RF	Tornillo de ajuste tangencial	Patrón ocular más nitido posible	*Note: No emplee una llave hexagonal en forma de L Emplee una como la mostrada a la izquierda. Si emplea una llave hexagonal en forma de L Puede hacer que se afloje la bandeja [consulte la página 59 5."Ajuste de reticula (1)"].* • Presione secuencialmente las teclas TRACK FWD (▷▷I) y PLAY (▷) para cerrar los servos (el indicador de pausa se encenderá). • Observe la forma de onda de la patilla 1 de TP1 (salida de RF) en el osciloscopio, y ajuste el tornillo de ajuste tangencial hasta lograr el patrón ocular más nitido posible. • El punto en el que el tomillo de ajuste tendrá que quedar está aproximadamente en mitad de los puntos en los que el patrón ocular se vuelve más borroso al girar dicho tornillo hacia la derecha y la izquierda. Cuando toda la forma de onda sea clara, concentre o aguce las lineas finas que forman el diamante en el centro del patrón ocular (consulte la foto 10-8). Ajuste hasta que las lineas finas de los cuatro lados del diamante queden nitidamente definidas y densas, como se muestra en la foto 10-6.  Fig. 10-12 *Nota: Emplee una llave hexagonal para levantar algo el captor cuando realice este ajuste.*



Concentre o aguce este diamante.



Insatisfactorio Ajuste óptimo Insatisfactorio

Foto 10-6

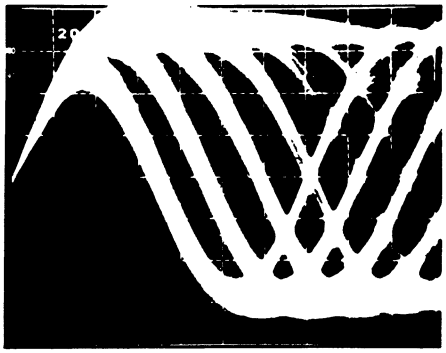


Foto 10-7

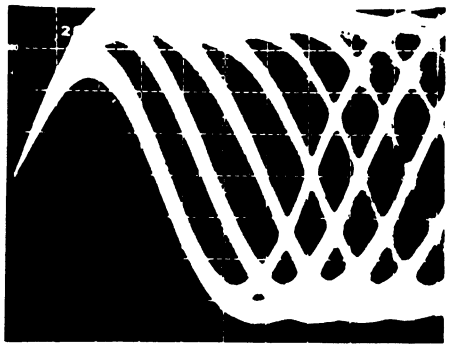


Foto 10-8

Foto 10-9

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
8	Ajuste de la ganancia de enfoque					
	50mV/div CH1(X), 5mV/div CH2(Y) (Sonda 10:1)		Eje X TP1 Patilla 5 (FOCS. IN) Eje Y TP1 Patilla 6 (FOCS. ERR)	VR3 (TRKG.GAN)	Diferencia de fase de 90é	• Con la limentación (del oscilador) desconectada, conecte el osciloscopio y el oscilador como se muestra en la Fig. 10-13 • Ponga la unidad en el modo de prueba (consulte la página 58). • Presione secuencialmente las teclas TRACK FWD (⊳⋈), PLAY (▷), y PAUSE (▯▯) para activar los servos de enfoque, del eje, y de seguimiento. • Conecte la alimentación del oscilador y ajuste su salida a una seùal de 1,2kHz, 1Vp-p. *Nota: Algunos osciladores descargan una tensión CC cuando se conecta su alimentación.Pro lo tanto, se recomienda conectar el oscilador después de haber conectado su alimenta-ción.* • Ajuste VR3 FOCS. GAN (ganancia de enfoque) de forma que la figura de Lissajous se convierta en un circulo horizontal (diferencia de fase de 90é).

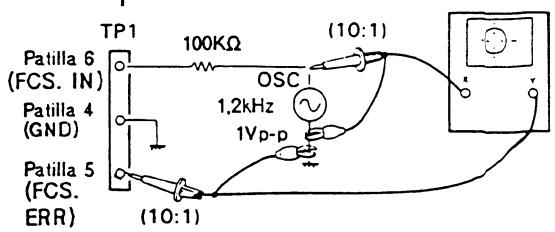
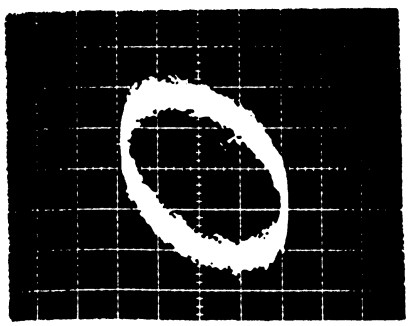
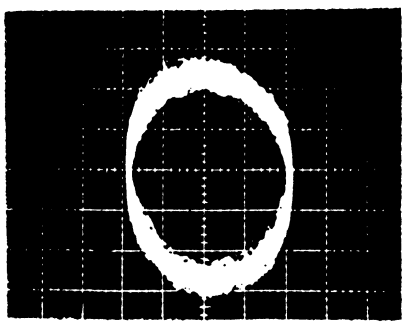


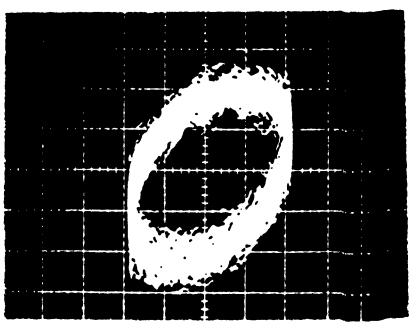
Fig. 10-13



Ganancia sobrecompensada
Foto 10-10.



Ganancia óptima
Foto 10-11.



Ganancia subcompensale
Foto 10-12.

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
9	Ajuste de la ganancia de seguimiento					
						• Con la limentación (del oscilador) desconectada, conecte el osciloscopio y el oscilador como se muestra en la Fig. 10-14. • Ponga la unidad en el modo de prueba (consulte la página 58). • Presione secuencialmente las teclas TRACK FWD (▷▷|), PLAY (▷), y PAUSE (▯▯) para activar los servos de enfoque, del eje, y de seguimiento. • Conecte la alimentación del oscilador y ajuste su salida a una seùal de 1,2kHz, 2Vp-p. *Nota: Algunos osciladores descargan una tensión CC cuando se conecta su alimentación. Por lo tanto, se recomienda conectar el oscilador después de haber conectado su alimenta-ción.*
	50mV/div CH1(X), 5mV/div CH2(Y) (Sonda 10:1)		Eje X TP1 Patilla 3 (TRKG. IN) Eje Y TP1 Patilla 2 (TRKG. ERR)	VR4 (TRKG. GAN)	Diferencia de fase de 90é	• Ajuste VR4 TRKG.GAN (ganancia de seguimiento) de forma que la figura de Lissajous se convierta en un circulo horizontal (diferencia de fase de 90é).

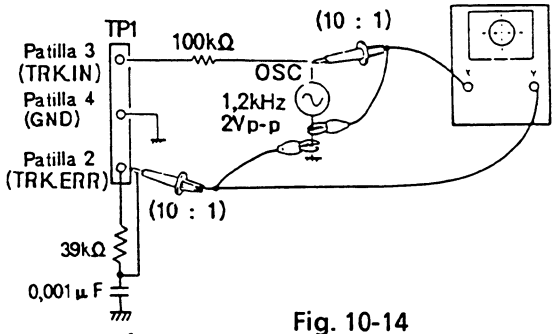
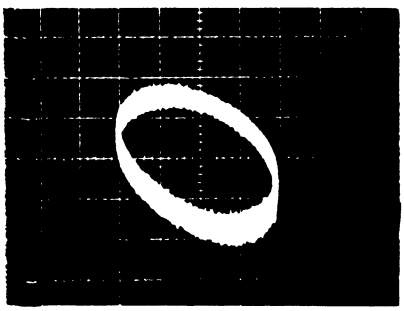
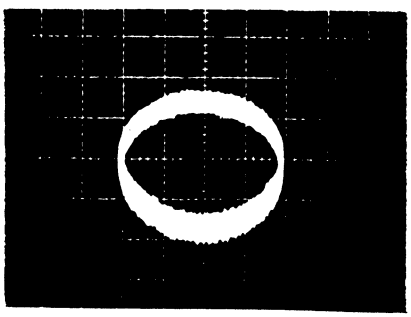


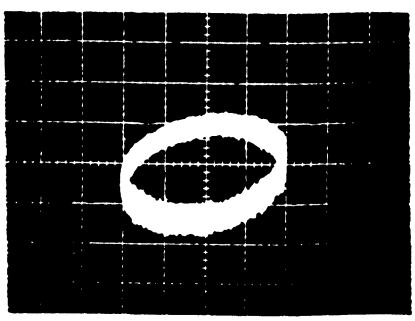
Fig. 10-14



Ganancia sobrecompensade
Foto 10-13.



Ganancia óptima
Foto 10-14.



Ganancia subcompensade
Foto 10-15.

Nº de paso	Ajuste del osciloscopio V	Ajuste del osciloscopio H	Puntos de prueba	Puntos de ajuste	Itemes de comprobación/ Especificaciones de ajuste	Procedimiento de ajuste
10	Ajuste de la frecuencia de oscilación libre del oscilador controlado por tensión (VCO)					
			TP2 Patilla 2	VR8 (VCO.ADJ)	4,375 ± 0,025MHz	• Ponga la unidad en el modo de prueba (consulte la página 58). • Cortocircuite ASY y GND con un destornillador a algún objeto similar (consulte la Fig. 10-13). • Conecte un frecuencimetro capaz de medir frecuencias de más 10MHz a la patilla 2 de TP2. • Ajuste VR8 (ajuste del VCO) hasta que el frecuencimetro indique 4,375 ± 0,25MHz.
11	Método de confirmación del error de enfoque					
			TP1 Patilla 6 (FOCS. ERR)			• Ponga la unidad en el modo de prueba (consulte la página 58). • Conecte a masa la patilla 5 de TP1 (ganancia de enfoque). • Observe la forma de onda de salida de la patilla 6 .FOCS.ERR de TP1 (error de enfoque) al presionar la tecla TRACK FWD (▷▷I).

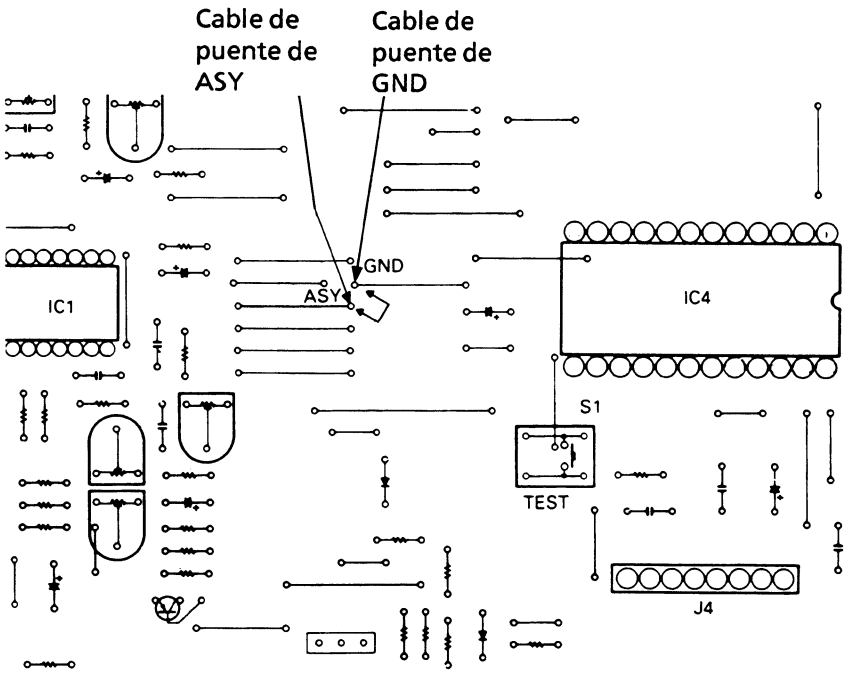


Fig. 10-15 Posición del cable de puente de ASY y GND.

11. FOR HB AND SD TYPES

11.1 CONTRAST OF MISCELLANEOUS PARTS

NOTES:

- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.
- *Parts marked by "◉" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.*

The PD-Z71/HB and SD types are the same as the PD-Z71/HEM type with the exception of the following sections.

Mark	Symbol & Description	Parts No.			Remarks
		PD-Z71/HEM	PD-Z71/HB	PD-Z71/SD	
⚠	AC power cord	PDG1008	PDG1010	RDG1003	
⚠ ★	Power transformer (220, 240V)	PTT1047	PTT1047	...	
⚠ ★	Power transformer (110, 120—127, 220, 240V)	...	...	PTT1048	
⚠ ★★	Line voltage selector (110, 120 — 127, 220, 240V)	...	...	PSB1002	
	Operating instructions (English)	...	PRB1039	PRB1039	
	Operating insturctions (Spanish)	...	...	PRC1004	
	Operating insturctions (English/French/German/Italian /Dutch/Swedish/Spanish /Portuguese)	PRE1039			

• Line Voltage Selection

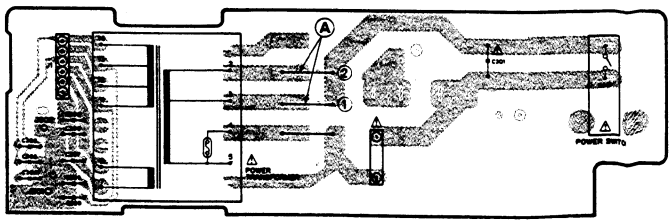
Line voltage can be changed with the following steps.

1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire Ⓐ as follows.

Voltage	Jumper wire Ⓐ position
220V	①
240V	②

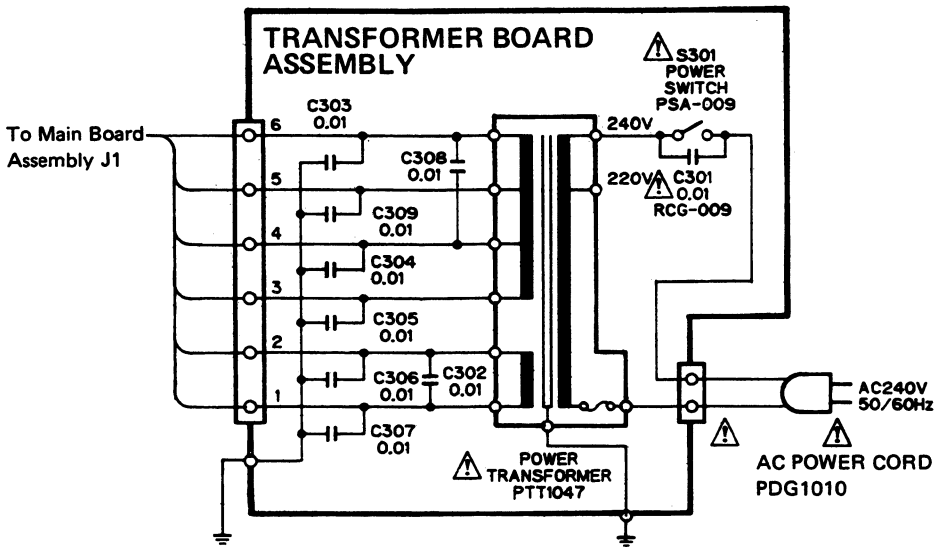
4. Stick the line voltage label on the rear panel.

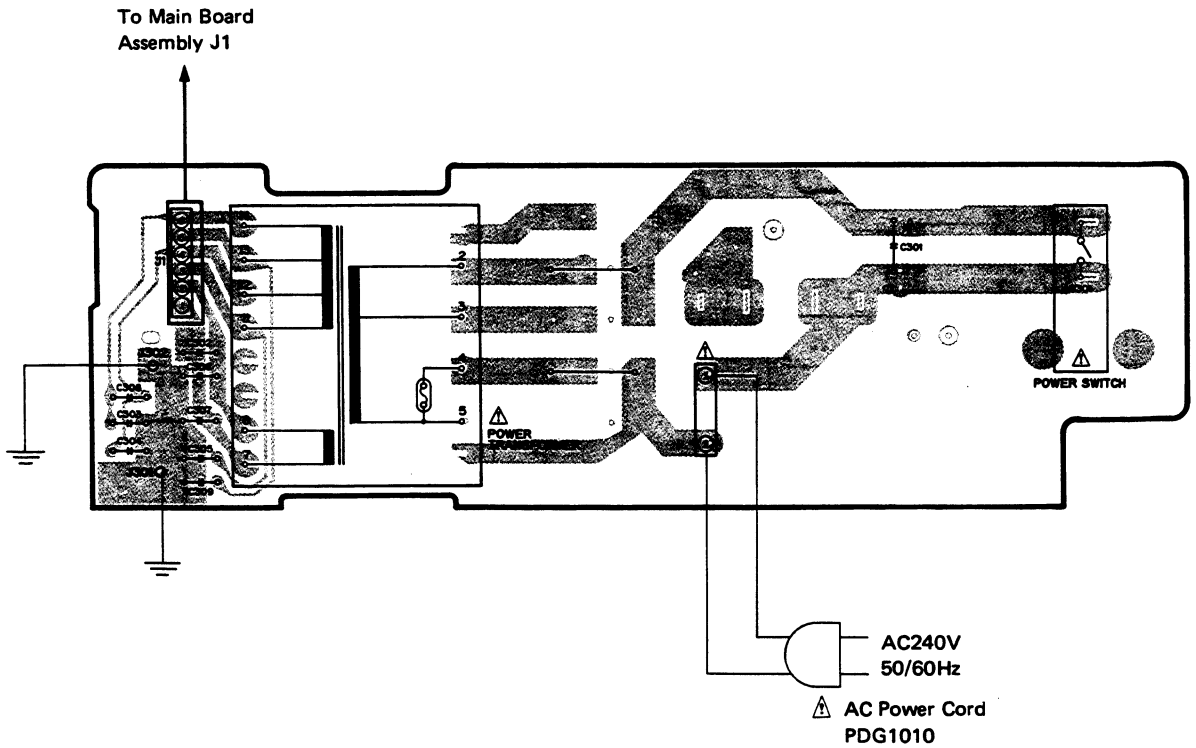
Part No.	Description
AAX-193	220V label
AAX-192	240V label



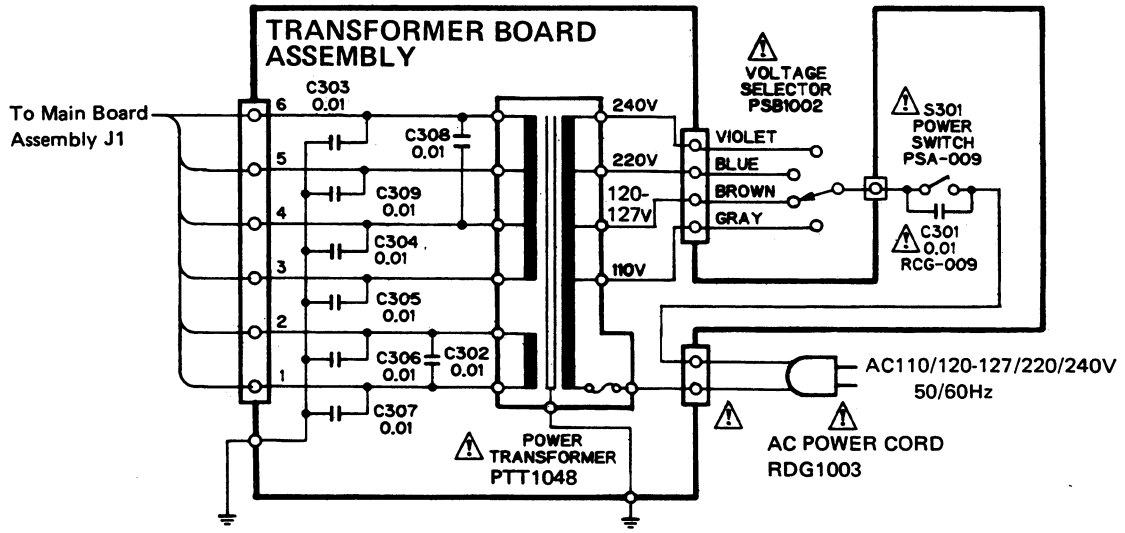
11.2 SCHEMATIC DIAGRAM AND P.C. BOARD PATTERN

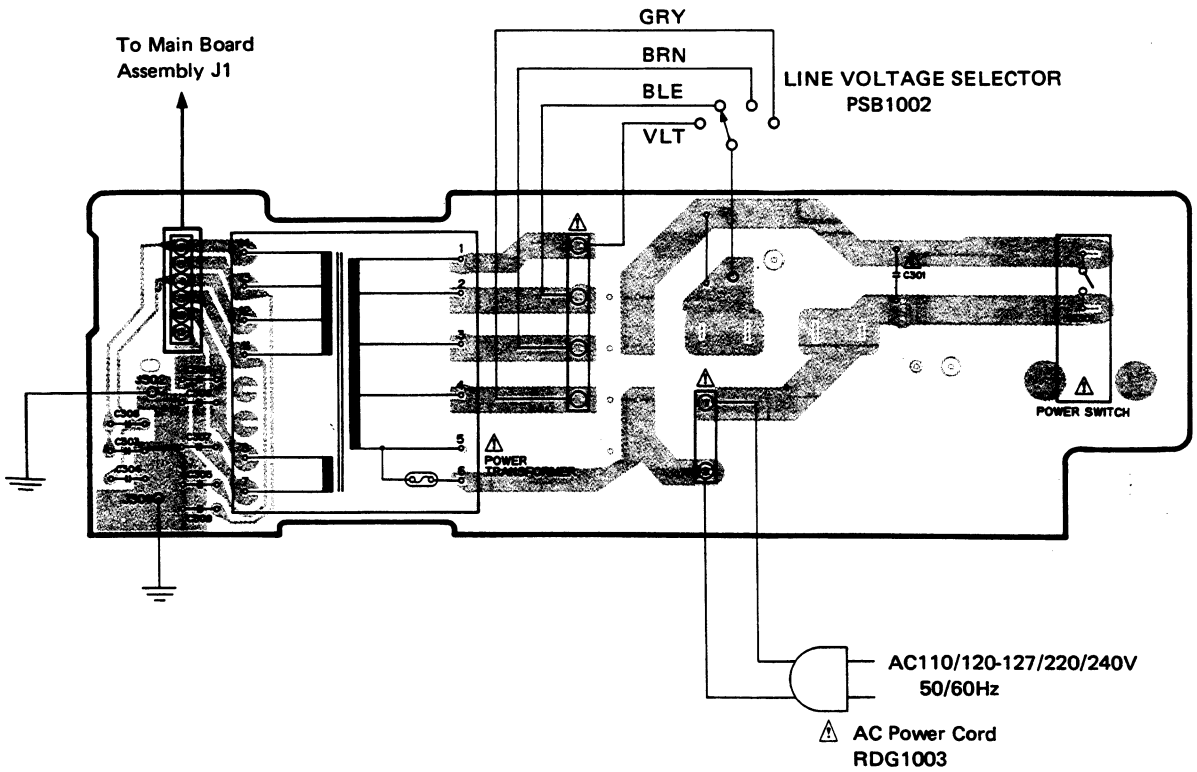
● For HB Type





● For SD Type


TRANSFORMER BOARD ASSEMBLY
To Main Board Assembly J1
C303 0.01
C308 0.01
C309 0.01
C304 0.01
C305 0.01
C306 0.01
C302 0.01
C307 0.01
240V
220V
120-127V
110V
VOLTAGE SELECTOR PSB1002
VIOLET
BLUE
BROWN
GRAY
S301 POWER SWITCH PSA-009
C301 0.01 RCG-009
AC110/120-127/220/240V 50/60Hz
AC POWER CORD RDG1003
POWER TRANSFORMER PTT1048


To Main Board Assembly J1
GRY
BRN
BLE
VLT
LINE VOLTAGE SELECTOR PSB1002
POWER SWITCH
AC110/120-127/220/240V 50/60Hz
AC Power Cord RDG1003